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ABSTRACT

This guide was developed to assist vocational instructors in automotive repair programs in presenting broadly applicable nontechnical (often called quality of work life--QWL) skills, such as interpersonal and group process skills, problem solving and decision making, planning, communications, reasoning skills, and organizational management skills. The guide provides examples of instructional strategies and student learning activities that can be used to integrate such objectives into existing programs. It also identifies supportive resources and indicates where they can be used to aid in developing QWL skills. The following traditional instructional methods are identified and discussed in the guide: the textbook-workbook approach, the lecture/discussion method, the demonstration method, and the show-and-tell method. The following additional approaches also are discussed: the project method, the problem-solving method, the discovery method, individualized instruction and performance-based instruction, the contract method, peer teaching and peer tutoring, simulation and role playing, the instructional worksheet method, the case-study method, the business enterprise and entrepreneurship approach, the unit approach, and miscellaneous techniques. Finally, the following experiential approaches are discussed: cooperative education and job shadowing. The guide also includes selected resources on quality of work life objectives; on the instructional approaches; and on selecting labor, business, and industry contacts. (KC)

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Research and Development Series No. 256

SKILLS FOR THE CHANGING WORKPLACE: AN AUTOMOTIVE REPAIR INSTRUCTOR'S GUIDE

by

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FOREWORD

To function effectively on the job, workers increasingly need improved skills in such broadly applicable, nontechnical areas as interpersonal relations and group processes, problem solving and decision making, planning, communications, reasoning, and business organization and management. While some of these skills may be addressed in vocational and technical education at the present time, they are seldom an explicit part of the program. Their development is rarely given the amount of emphasis—relative to job-specific skills—that their increasing importance seems to warrant.

This instructional guide was developed to assist instructors in electronics technologies in presenting broadly applicable, nontechnical work skills. The guide also should interest administrators and curriculum development specialists who are concerned with giving students relevant preparation for work.

This document describes some examples of instructional strategies and student learning activities for use in incorporating those types of skills into existing electronics programs. The guide also identifies supportive resources to aid in the development of these broadly applicable skills.

The National Center is deeply indebted to the many individuals who have generously donated their time and insights in developing this guide. We greatly appreciate the invaluable help of the project's technical advisory panel and wish to thank Vernon Harrenstein, Auto Mechanics Instructor, Stevenson Area Career Center, Freeport, Illinois; Ellis E. Lawrence, Associate Professor for the Department of Industrial Arts and Technology, Elizabeth City State University, Elizabeth City, North Carolina; Howard Raymond, Principal at F. Donald Myers Occupational Education Center, Saratoga-Warren BOCES, Saratoga Springs, New York; and Jack Vasko, Teacher Educator in the Vocational Education Department, Kent State University, Kent, Ohio. We also wish to thank Allen Wiant, Research Specialist at the National Center, who assisted in the early stages of the project.

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Finally, we wish to thank the authors, Robert D. Bhaerman, Research Specialist, of the National Center and Mr. Ricke A. North, Automotive Instructor, of the Columbus (Ohio) public schools for their preparation of the instructional guide. Sharyn Eberhart and Sherri Trayser provided typing support and Janet Kiplinger edited the final manuscript.

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EXECUTIVE SUMMARY

Early in 1984, the National Center completed its report *The Changing Workplace: Implications of Quality of Work Life Developments for Vocational Education*. Among other things, the document examined implications of quality of work life (QWL) developments for future skill requirements and their consequences for vocational and technical education policies and programs. The authors—Pratzner and Russell—hoped that the report would lead to a greater understanding of the educational implications of QWL developments by various vocational and technicial educators, including instructional personnel. This report, indeed, lead to the development of this instructional guide for postsecondary school instructors in the electronics technology curriculum.

The instructional guide basically follows the format of standard guides. That is, it includes teaching and learning objectives and a variety of instructor and student activities. Its purpose is to assist instructors in electronics technology by infusing broadly applicable nontechnical objectives—quality of work life skills—into technical curriculum. The guide, therefore, describes examples of instructional strategies and student learning activities that can be used to integrate such objectives into existing programs. It also identifies supportive resources and indicates where they can be used to aid in developing these skills.

On the basis of Pratzner and Russell's report, the following broad skill areas have been targeted in this guide for infusion into existing technical curricula: (1) interpersonal skills, (2) group process skills, (3) problem-solving skills, (4) decision-making skills, (5) planning skills, (6) communication skills, (7) reasoning skills, and (8) organizational and management skills. Within these general categories, a number of more specific objectives also are identified.

The term *infusion process*, simply means that teaching and learning objectives are incorporated wherever possible and whenever the technical curriculum lends itself; that is, attitudes, nontechnical skills, and knowledge become a thread weaving through the curriculum. These objectives do not replace the normal content; however, what in the past may have been implicit in instruction now would simply be made more explicit.

As a result of an analysis by the authors of this guide, the following traditional instructional methods are identified and discussed in the guide: the textbook-workbook approach, the lecture/discussion method, the demonstration method, and the show-and-tell method.

The following additional approaches also are discussed: the project method, the problem-solving method, the discovery method, individualized instruction and performance-based instruction, the contract method, peer teaching and peer tutoring, simulation and role playing, the instructional worksheet method, the case-study method, the business enterprise and entrepreneurship approach, the unit approach, and miscellaneous techniques.

Lastly, the following experiential approaches are discussed: cooperative education and job shadowing.

The format for presenting each instructional approach is as follows: (1) a brief description; (2) a discussion of procedures, instructor and student roles, and—in some cases—general activities; and (3) guidelines for infusing the objectives—including some examples that point out which quality of work life objectives are relevant. As noted, the second part of the guide includes selected resources on quality of work life objectives; on the instructional approaches; and on selected labor, business, and industry contacts.

PURPOSES AND RELATED BACKGROUND INFORMATION

Why Was This Guide Developed?

In January 1984, working for the National Center for Research in Vocational Education, Pratzner and Russell completed their report on *The Changing Workplace: Implications of Quality of Work Life Developments for Vocational Education*.* The report was based on a review of the literature concerning interviews and observations at nine firms that are recognized leaders in quality of work life (QWL) activities. The authors examined the implications of QWL development for future skill requirements and their consequences for vocational and technical education policies and programs. The report also provided background information to familiarize vocational and technical educators with QWL developments in the workplace. The authors hoped that the report would stimulate further examination and lead to a greater understanding of the educational implications of QWL developments by various vocational and technical educators—including program developers, curriculum specialists, and instructional personnel.

The 1984 report, moreover, led to the development of this instructional guide for postsecondary school instructors in the electronics technology curriculum. Similar guides were developed, as a result of the report, for marketing and distributive education and the automotive curriculum areas at the secondary school level and for business and office occupations programs at the postsecondary level.

What Are the Purposes of the Guide?

Although instructional guides come in differing shapes and sizes, essentially, they follow a similar format. Normally they include teaching and learning objectives, a variety of instructor and student activities, and resource materials that may be used selectively to meet a particular situation. In short, their content "suggests" rather than "prescribes."

This guide follows the standard format. Specifically, its purpose is to assist postsecondary school instructors in electronics technology in the infusion of broadly applicable, nontechnical objectives into their technical curriculum. In addition to describing examples of instructional strategies and student learning activities that can be used to integrate such objectives into existing programs, the guide also identifies supportive resources and indicates where they can be used to aid in the development of these skills.

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*F. Pratzner and J. Russell, *The Changing Workplace: Implications of Quality of Work Life Developments for Vocational Education* (Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1984)

Why Is It Important to Consider the Ideas in This Guide?

The answer to this question requires a detailed response. First of all, consider the following three brief items from rather diverse sources:

> According to a recent report from the National Academy of Sciences, a blue-ribbon panel of employers, educators, and economists states that "graduates of American high schools need to be adaptable to changes in the workplace more than they need any particular job skill. . . . The adaptability is by far the most important characteristic of the young person entering the workplace."
>
> from the National Academy of Sciences, *High Schools and the Changing Workplace: The Employers' View* (Washington, DC: National Academy of Sciences, 1984), pp. 19-20.

> The director of the AFL-CIO Department of Education, points out that "historically, the AFL-CIO . . . urged that vocational education students receive a comprehensive education with emphasis on basic education skills rather than a program that is too job specific."
>
> from Dorothy Shields, "The History and Value of Organized Labor's Linkage with Vocational Education." A Staff Development Seminar presentation (Columbus: The National Center for Research in Vocational Education, The Ohio State University, 6 August 1984), p. 9.

> According to a recent report, "The proliferation of high technology industries and their products is far more likely to reduce the skill requirements of jobs in the U.S. economy than to upgrade them. . . . The educational implications of high technology are that a solid basic education rather than narrow vocational prepara tion will become more important in the future."
>
> from H. M. Levine and R. W. Rumberger, *The Educational Implications of High Technology* (Palo Alto: Institute for Research on Finance and Governance, 1983), pp. 12-13.

As these items illustrate, a growing consensus exists in the management, labor, and education sectors that work will increasingly require individuals who are able to initiate and respond to changes in work organization. Sociotechnical developments in the workplace—social developments and technological changes in the nature of jobs and organization of work—have unknown consequences for job skills. As a result, both colleges and secondary schools must emphasize the development of skills that are broadly applicable in a variety of settings. Pratzner and Russell indicate that such skills include interpersonal relations and group processes, problem solving and decision making, planning, communication, reasoning, and business organization and management.

To serve the needs of today's young adults who must work in tomorrow's jobs, vocational and technical educators should emphasize occupational adaptability in their programs and should develop approaches for doing so. Developing such skills can complement the teaching of occupationally specific knowledge. Accomplishing both purposes calls for refocusing instructional strategies and learning activities and for infusing them into vocational and technical education classrooms and laboratories.

According to Pratzner and Hussell, two widely held—but false—assumptions about the teaching of nontechnical skills may be impeding our efforts to infuse them into existing programs. One is that these skills are most effectively taught through a combination of lecture and listening. The second is that vocational and technical education can do little to develop these skills. Nevertheless, no basis exists for the belief that skills such as problem solving or decision making are best

learned through lecturing. In fact, experience suggests that lecturing about these skills is probably the least effective means of presenting them. Instead, students must be provided with a range of opportunities to apply these skills. Indeed, the more opportunities given to students to practice them and the more realistic the opportunities are, the more effective the teaching will be. Also, given such instruction, students are far more likely to exhibit sustained interest and involvement.

While vocational and technical education have a shared responsibility with other training programs to contribute to the development of these skills, they are unique among educational programs in their potential for so doing. This is because they provide unparalleled opportunities for hands-on approaches and for extensive application. Unfortunately, this potential is routinely overlooked in our continual pursuit of specialized skill development.

In summary, the Education Commission of the States lists nine job skills that will be necessary as we move into the last decade of this century. A majority of these skills are relevant to the quality of work life skills stressed in this guide. They are as follows:

- Evaluation and analysis skills
- Critical thinking
- Problem solving—including mathematics
- Organizational and reference skills
- Synthesis
- Application to new areas
- Creativity
- Decision making with incomplete information
- Communication skills in many modes*

For Whom Is This Guide Intended?

In addition to postsecondary school instructors in the electronics technology, this guide should interest administrators and curriculum specialists at the local, State, and regional levels and any other educator concerned with providing students with up-to-date and relevant preparation for work.

What "Raw Materials" Were Used to Develop the Guide?

Initially, the Educational Resources Information Center (ERIC) database was searched to acquire relevant curriculum materials and instructor's guides. Many of the documents identified in the ERIC search were available at the Research Library of the National Center for Research in Vocational Education. In addition, members of the project's technical advisory panel submitted a number of useful resources. Lastly, several textbook publishing companies demonstrated their support of this activity by contributing texts, workbooks, and related materials.

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*Education Commission of the States, *Information Society* (Denver: Education Commission of the States, 1982).

What Does the Guide Include?

Before turning to the information itself, it is important to reiterate what this guide is—and what it is not. It is a "sampler" in that it includes many objectives, activities, and resources that instructors might wish to consider in their teaching. But it is not, by any means, an encyclopedia; it is far from complete. Teachers will definitely want to discover and use other related objectives, additional learning activities, and supplementary resources. For example, while the instructional guide does not devote a separate section to computer technology, it is clear that the future holds a great deal of involvement with the classroom use of microcomputers, hardware, and software of various types. As you use the guide, you undoubtedly will see many places where the use of computers can be integrated into various instructional approaches.

Again, the guide is suggestive, it is not prescriptive. Finally, it should be remembered that this is a guide; it is not a curriculum. It may, however, help in complementing many of the technical skills taught in the existing curriculum. It will be useful because, as students move into the reality of the changing workplace, quality of work life and participative work environment nontechnical skills will most likely be part of that workplace.*

*The terms *quality of work life*, *participative work environment*, and *nontechnical skills* are often used interchangeably. Such is the case in this guide where each of these terms is used frequently. The meaning of these terms is implicit in the teaching and learning objectives delineated in the following section.

QUALITY OF WORK LIFE
TEACHING AND LEARNING OBJECTIVES

In their report on the changing workplace, Pratzner and Russell* identify a number of non-technical skill areas essential for success in business and industry. (See figure 1, at the end of this section, adapted from that earlier report.) On the basis of that synthesis, the following eight broad *teaching and learning objectives* have been adapted for use in this instructional guide:

1. To infuse *interpersonal skills* into the curriculum
2. To infuse *group process skills* into the curriculum
3. To infuse *problem-solving skills* into the curriculum
4. To infuse *decision-making skills* into the curriculum
5. To infuse *planning skills* into the curriculum
6. To ensure that *communication skills* are integrated into the curriculum
7. To ensure that *reasoning skills* are integrated into the curriculum
8. To ensure that *organizational and management skills* are integrated into the curriculum

Within these general categories, the following specific learner objectives can be readily identified:

1. **Interpersonal skills**
   - To work effectively under different kinds of supervision
   - To work without the need for close supervision
   - To be on time for activities and appointments
   - To work effectively when time and pressure are critical factors for success
   - To see things from someone else's viewpoint
   - To engage appropriately in social interactions
   - To be responsible for the effects of one's own judgments and actions

*Pratzner and Russell, *The Changing Workplace*, pp. 22-23.

- To plan, conduct, and complete activities at one's own initiative
- To speak with others in a relaxed, self-confident manner
- To initiate task-focused conversations with others

2. **Group process skills**

- To work cooperatively as a team member
- To work effectively with people of different personalities
- To explain persuasively the rationale underlying judgments and actions arrived at by a group
- To coordinate one's activities with others
- To instruct or direct someone in the performance of a specific task
- To demonstrate how to perform a specific task
- To assign others to carry out specific tasks
- To join in and draw others into task-focused conversations
- To plan, convene, lead, and manage meetings
- To lead a group to resolve disputes in the opinions or positions of its members in order to achieve a consensus
- To follow established procedures for group participation and decision making

3. **Problem-solving skills**

- To identify the existence of a problem, given a specific set of facts
- To function effectively in the face of ambiguity
- To ask appropriate questions to identify or verify the existence of a problem
- To enumerate the possible causes of a problem
- To formulate alternative statements relating a problem to its possible cause
- To identify important information needed to solve a problem
- To generate possible alternative solutions
- To describe the application and likely consequences of alternative solutions
- To compare the application and likely consequences of alternative solutions and select a solution that presents the best course of action

4. **Decision-making skills**

   - To estimate the potential likelihood of some event's occurrence and probable consequences
   - To project resource requirements for alternative scenarios
   - To determine the relevance and quality of available data and information
   - To identify needed information and information that could be located or generated
   - To delineate assumptions underlying various options
   - To use appropriate processes in order to facilitate making a decision

5. **Planning skills**

   - To set priorities in which several tasks could be accomplished
   - To set the goals or standards for accomplishing a specific task
   - To enumerate a set of possible activities needed to accomplish a task
   - To determine how specific activities will assist in accomplishing a task
   - To select activities to accomplish a specific task
   - To determine the step-by-step process by which a specific task may be accomplished
   - To estimate the time required to accomplish a specific task
   - To select materials and resources needed to perform a specific task
   - To revise or update activities and plans periodically in order to accomplish a specific task

6. **Communication skills**

   - To choose appropriate words that convey accurate meanings in both writing and speaking
   - To gather information or data from books, manuals, and other printed documents
   - To read graphs, charts, and tables—as well as memos and forms—in order to obtain factual information
   - To compose written directives, memos, and reports
   - To speak fluently and effectively with both individuals and groups
   - To restate or paraphrase a conversation to confirm one's understanding of what was said

- To ask appropriate questions to clarify another's written or oral communication
- To listen carefully and take accurate notes from spoken conversation

7. **Reasoning skills**

- To generate or conceive new ideas
- To use previously learned knowledge and skills in a new situation
- To explain the main idea in another's written or oral communication
- To recall ideas, facts, and information accurately
- To organize and express ideas rapidly in oral and written discourse
- To interpret ideas or facts in terms of one's personal viewpoint or values
- To state a position clearly and defend it
- To distinguish between fact and opinion in one's own and in others' written and oral communication
- To compile notes, ideas, and materials from several sources into a single report
- To observe—and ask questions about—another's performance in order to identify whether the performance is satisfactory or whether it needs improvement

8. **Organization and management skills**

- To understand and apply concepts of business economics
- To understand and apply concepts of business operation
- To understand and apply concepts of management
- To understand and apply concepts of statistical quality control
- To understand the quality of work life philosophy, as well as its rationale, history and development, concepts and approaches, and methods and techniques

Skill Area	Reason for Need in Business/Industry
I. Group Problem Solving	Group problem solving is one of the primary modes for change and improvement in high-involvement companies
A. Interpersonal Skills	
• Self-directed	To enhance flow of ideas
• Flexible	To reduce need for supervision/inspection
• Assertive	To change as market conditions change
• Open	To reduce inefficiencies due to personal conflicts
• Curious to learn	To reduce nonproductive time
• Able to share/teach	To profit from people's individual motivations
• Responsible	To promote sharing/cooperation
• Understanding of behavior	To encourage continuous improvement
	To facilitate individual and corporate growth
	To acknowledge and encourage input from workers at all levels
B. Group Process Skills	
• Role theory/norm theory	To have similar goals held by all to increase the possibility of reaching goals
• Techniques of structuring discussions	All workers need to serve as leaders in various activities because of need for flexibility
• Cooperative attitude	Fifty people can work together and not just independently
• Leadership	Cooperation proves more productive than competition
	To encourage equal participation
C. Problem-solving Skills	
• Problem identification	To be rational in addressing problems
• Problem-solving process steps	To be systematic and comprehensive in addressing problems
• Data collection and analysis	To address the correct issue
	To generate the critical information necessary for solving problems
D. Decision Making	
• Risk assessment	If management is pushed to lower levels, decision making goes on at lower levels
• Data review	Organizational philosophy (values) shared with all workers enhances mutual goal development
• Identifying gaps in information	
• Values	

Skill Area	Reason for Need in Business/Industry
D. Decision Making (continued)	To be aware of information relevant to a decision
• Process models/ choice models	To understand the importance associated with various factors within a decision
	To make better decisions with improved results
E. Planning	
• Goal setting	If management is pushed to lower levels, planning goes on at lower levels
• Establishing measurable action steps	If the process is right, product will end up "right"
	Feedback is necessary for continued improvement
F. Communication	
• With individuals	Presentation of own and the group's ideas is required for management action
• With groups	Group work rather than individual work is the mode
• Presentation skills	Necessary to listen if want to learn from others
• Verbal skills	Change requires sharing, discussing, analyzing, persuading, etc.
• Writing skills	
• Listening skills	
G. Thinking/Reasoning	
• Generating alternatives	If all are to contribute, all must think effectively and creatively
• Estimate and approximate	Decision making, planning, problem solving all require critical thinking, and these skills will be required of all levels of workers, not just management
• Giving and getting meaning	
• Collecting information	
• Classifying	
• Finding patterns	
• Generalizing	
• Sequencing and scheduling	
• Using Criteria	
• Reshaping information	
• Judging information	
• Communicating effectively	

Figure 1. Nontechnical skill areas and their need in business and industry

SOURCE: Pratzner and Russell, *The Changing Workplace*, pp. 47-53.

Skill Area	Reason for Need in Business/Industry
II. Organization and Management	All workers share more of the management responsibilities in high-involvement companies
A. Business Economics	
• Relationships between costs and income	To act as a team and know how individual effort fits in
• Market standing/ environmental conditions	To enhance ability to change as called for
• Basic economic theory	To encourage productivity through incentives and information sharing
• Reward structure	To reduce waste, duplication
B. Business Operations	
• Relationships between function systems	To encourage acting as a whole
• Coordination of resources	To reduce duplication of effort
	To provide feedback, information for correction purposes
	To enhance appropriate assignment of resources to maximize results as a whole
C. Management	
• Management theory	To exchange information effectively
• Relationships between performance and other factors	To motivate and lead coworkers
	To attain desired performance
	To facilitate workers' quality of daily activities and long-range career goals
• Models of communication	To improve attendance; reduce turnover, sabotage, grievances
• Power/control/ authority/ delegation	To attain improved union/management relations
	To reduce stress
• Human resource development	To tap knowledge of line workers
	To improve and change continuously as needed
• Feedback/appraisal	To avoid necessity for resolving same problem
• Job analysis	To enhance match between technology, people, and procedures/policy
• Change processes	To determine if goals have been met, should be modified, expanded, etc.

Skill Area	Reason for Need in Business/Industry
D. Statistical Quality Control	
• Sampling	To improve quality, reduce defects, reduce waste of time and measures
• Quality standards	
• Cause and effect	To identify and analyze problems
• Graphs and charts	To improve productivity, efficiency
• Data analysis	
• Mathematics and statistics	
E. Introduction to QWL	
• Definitions of terms and concepts	To enhance understanding of the need for group process and organizational management skills
• Philosophy	
• Role of QWL at various levels in companies	
• Union/nonunion involvement	

Figure 1—*continued*

INFUSING OBJECTIVES INTO INSTRUCTION

Infusion Rather Than Delusion

It would be a delusion to think that a new course, series of courses, or even separate units of a course could be added to the already-crowded electronics curriculum. And perhaps it would be an even greater delusion to think that quality of work life objectives should be added directly on top of existing technical skill objectives. *It is unrealistic to think that these objectives either could or should be treated as "add-ons."*

Instructors simply cannot effectively teach such subject matter content in the abstract. Although it is true that one can lecture or lead a discussion, nontechnical skills need to be practiced in situations similar to—or which could be made similar to—those found in the workplace. Actually practicing these skills in a realistic way is much more likely to be successful than is building a bridge of abstractions. Moreover, most instructors are not experts in group processes or group dynamics. Fortunately, it doesn't take an expert to apply this approach in a practical fashion. It is also fortunate that instructors in electronics technology have many opportunities to integrate these objectives into the daily life of the classroom or laboratory in ways that make sense and are likely to "pay off" in the long run.

What exactly is meant by *infusion*? The term simply means that teaching and learning objectives are incorporated wherever possible and whenever the technical curriculum lends itself; that is, attitudes, nontechnical skills, and knowledge become parallel threads weaving through the curriculum. Although it may not always be seen, the thread is there. These objectives, obviously, are not intended to replace the normal content. Many of them already are being taught—or caught—in many classrooms and workshops. However, *what in the past may have been implicit in instruction now simply would be made more explicit*. In short, the electronics technology curriculum could be characterized as coffee and the quality of work life objectives as cream. When the two are mixed, they are no longer discernable in their original form.

Instructional Approaches: A Cafeteria of Possibilities

If *the infusion process* can be considered as cream in one's coffee, the variety of available instructional approaches can be compared to a cafeteria. Instructors can, and do, select from many different teaching and learning strategies—either consciously or unconsciously. Sometimes they make a meal of one approach, but—for a more balanced diet—they tend more often to mix their methods. This is as it should be since—to continue the metaphor—instructors need to spice their menus with a variety of flavors.

A search of the literature on instructional guides produced several resources that identify a number of instructional possibilities in the classroom and laboratory. The two most useful resources were *The Industrial Arts Teacher's Handbook: Techniques, Principles, and Methods* and

Instructional Methods in Occupational Education.* Even though these two books focus on industrial arts and occupational education, they are flexible, fairly general in nature, and easily adaptable.

As a result of this analysis, the following *traditional instructional methods* were identified and are discussed in this guide:

- Textbook-workbook approach
- Lecture/discussion method
- Demonstration method
- Show-and-tell method

The following *additional approaches* are also discussed:

- Project method
- Problem-solving method
- Discovery method
- Individualized instruction and performance-based instruction
- Contract method
- Peer teaching and peer tutoring
- Simulation and role playing
- Instructional worksheet method
- Case-study method
- Business enterprise and entrepreneurship approach
- Unit approach
- Miscellaneous techniques

Lastly, the following *experiential approaches* are discussed:

- Cooperative education
- Job shadowing

These approaches often are not "self-contained"; that is, a *good deal of overlap* is evident among them. For the purpose of this analysis, however, they are separated into categories, as in the works of Maley and Nystrom and their colleagues. It does not matter whether all of the approaches are used or a combination or whether some of the approaches with different terminology are used. The important point is that a wide variety of instructional approaches exist, and hence, a wide variety of opportunities are available to infuse quality of work life objectives into technical instruction.

Some objectives will be more directly related to specific instructional approaches than others; for example, problem-solving skills (see teaching and learning objective #3 in the previous section) have direct relevance to the problem-solving and discovery methods. This, of course, would be expected.

Secondly, it is to be hoped that these objectives will become second nature to instructors; that is, eventually they will not even consciously think about the infusion process. For the moment, however, the important idea is that instructors at least *consider* the infusion concept. Ultimately, they may become "true believers" that this type of infusion can—and should—be done in the classroom or laboratory.

*D. A. Maley, *The Industrial Arts Teacher's Handbook: Techniques, Principles, and Methods* (Boston: Allyn and Bacon, 1978); D. C. Nystrom, G. K. Bayne, and L. D. McClellan, *Instructional Methods in Occupational Education* (Indianapolis: The Bobbs-Merrill Company, 1977).

Each approach will be closely examined. Following is a brief description of the approach, then a brief note on some of the more important procedures is presented along with a discussion of the more important roles for both the instructor and the student. Most significantly, suggestions concerning *some*—but not all—opportunities for infusing the objectives into instruction are provided. This guide is open-ended in that ideas of one's own based on either personal experiences or those of colleagues can be added. Since this guide is only the "tip of the iceberg," instructors are encouraged to create their own unique examples. For example, as noted earlier, you undoubtedly will want to add examples which deal with the classroom use of computers.

The second part of the guidebook will also provide some additional useful resources. Here, too, others could undoubtedly be added since what is represented here is only a small portion of what is available.

Here, in summary, is the *format* for each instructional approach:

1. Brief description (in an introductory box)
2. Procedures and instructor and student roles (and in some cases, general activities)
3. Asterisks (used to separate the sections)
4. Infusion of the objectives (including some examples that point out which quality of work life objectives are relevant)

Some Introductory Thoughts on Implementation and Evaluation

A typical automotive program catalog describes courses in terms of technical skill mastery in many areas, for example, cooling systems, fuel systems, steering systems, power disc brakes, and so on. Other content area instructors—those dealing with people more than with things or with less complex subject matter—seem able to work into their courses such goals as "working cooperatively," "learning to set goals," "being able to describe major management theories," and the like on a routine basis. Why have automotive instructors paid relatively little attention to nontechnical skills?

The primary reason, undoubtedly, is the amount of material to be learned in a relatively short time. Many instructors have a difficult time simply "covering" the technical content. As a result, they often do not take the time to develop any skills other than problem-solving in the typical automotive curriculum. This guide—which offers instructors some suggestions with which to infuse quality of work life objectives into the already-crowded schedule—can be very valuable, provided that the instructor is convinced of their value. Becoming convinced, is clearly the important "first step" that needs to be taken.

With regard to evaluation, it is unreasonable to believe that any instructor would want to give grades in courses such as "Servicing Automatic Transmissions," "Automotive Engine Foundations," "Automotive Electronics," and the like based on how well the students worked cooperatively as team members. Such grading criteria still seem more appropriate in nontechnical courses. However, if instructors realize that today's automotive technicians need quality of work life skills, then they should have some means of assessing their progress in infusing these skills into the classroom or workshop. Such evaluation must necessarily be primarily subjective since little time exists for more objective-type evaluations. A list of things to look for might be appropriate. As the

course progresses, the instructor might note how well students work in a classroom situation without direct supervision compared to how well they did earlier in the course. Instructors also might compare students' problem-solving abilities on earlier exams with those reflected on later ones. In other words, instructors must know what to look for to assess progress.

Many nontechnical skills can be ascertained by changes in student attitude. Perhaps, then, some attitudinal survey could be given on the first day of class and again on the last day—with results compared. Instructors should develop additional evaluation tools consistent with their own teaching approaches and methods.

All in all, it is a difficult task to feel motivated to monitor progress when it is not an official class goal and when the students may not even be aware of the goal. Also, another caution must be mentioned; namely, there is a slight danger that instructors might be tempted to raise students' grades if they are able to show progress in communication skills while their accomplishments in the workshop situation are limited. It must be remembered that the future employer, after all, is buying technical skills and wants to see grades that reflect such skills. Instructors must keep this in mind, even though they may be attempting to integrate nontechnical skills into a very technical content area. A balanced program and a common-sense evaluation plan, obviously, are the only ways to go.

TRADITIONAL INSTRUCTIONAL APPROACHES

Textbook-Workbook Approach

Everyone is familiar with textbook format and use. It is estimated that textbooks provide the source for 90 percent of instruction; hence, they wield a powerful influence on students. Their essential characteristic is that they are designed as written guides to the subject content of a course of study; their basic task is to present data and information about a specific subject.

Texts frequently present data of a higher order: concepts, rules, and generalizations—as such, their function is as a "presenter." Texts also attempt to establish relationships among data; in this role they serve as "explicators." Textbooks also contain exercises, study questions, and practice materials, although sometimes these are included in a separate workbook. One type, programmed texts, is designed to permit students to proceed at their own pace. Texts frequently are published with accompanying instructors' manuals, supplementary readings, and audiovisual materials.

Textbooks sometimes are used as the basis for an entire course, or they may be used simply as a resource for additional study or outside assignment and reading. While no one correct way exists to use them, it is important to be aware of their value. Their major function is to provide an orderly introduction to a subject field and to give students an organized means of reviewing and reorganizing knowledge. Textbooks and workbooks can be used in conjunction with many other learning strategies and teaching methods.

Traditionally, when using a textbook as the core of a curriculum, instructors proceed from the first chapter to the last, stopping to clarify, explain, elaborate, and make assignments. The role of the students is to study the materials, take notes, ask questions, and complete the assignments. Textbooks and workbooks have their limitations in that they cannot present all that is known about a topic; and depending on the subject matter, they may quickly become out-of-date. Certain types of learning—such as that required for mastering many nontechnical skills—cannot be effectively presented through the printed page; this fact argues against the sole use of and dependency on a single text.

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Textbooks-workbooks provide a good method for presenting information about the nontechnical skills that are common to businesses concerned with establishing a "participative work environment," especially those skills related to organization and management. Although textbook information could prove helpful in the students' understanding of such skills as group processes, decision making, planning and reasoning, actual practice using the skills also is desired. Communication skills (see teaching and learning objective #6) also could be taught using this approach.

However, the most effective use of this possible strategy could be made in teaching certain organization and management skills relating to business economics, business operations, and management (objective #8). These organization and management skills are involved in more cognitive knowledge-type learning objectives—readily taught using textbooks.

Since most textbooks or workbooks used in the automotive field deal with general automotive basics and concepts, they should not be used as the sole source of automotive technology. Textbook and workbook assignments should be supplemented with handouts whenever homework assignments are made. One valuable way to use textbooks and workbooks is to make all the assignments on Friday for the following week. Instructors should write the assignments on the board and leave them until the end of the class on Monday. This approach allows students to plan their schedules in order to complete their assignments. Students should be instructed that no late assignments will be accepted. Being absent does not excuse the student from completing the next day's assignment. This approach teaches students that they are responsible for their own actions and that they must use their time effectively. By planning lessons so that students will have to use more than one resource to complete the lesson, students will develop problem-solving skills (objective #3). They will also have to decide what additional resources are needed and how that information will help them complete their assignments.

Lecture/Discussion Method

A lecture is a carefully prepared oral presentation of a subject by a qualified person, either the instructor or an outside resource person. In addition to employing the strictly oral approach, a lecture may be supplemented with a variety of visual aids, illustrations, charts, or handouts; or it may include some sort of demonstration. The lecture may be the technique to use when topics and goals point toward doing one or more of the following: presenting information in an organized way, identifying or clarifying problems or issues, encouraging further study or inquiry, or introducing a new topic. From the student's point of view, lectures—accompanied by discussions—can develop content comprehension, improve attitudes, and build knowledge of specific concepts.

Generally speaking, three steps normally are involved when assessing the lecture/discussion method as a learning strategy: establishing its need, developing its specific purpose, and determining its applicability to the unit of study. Depending on the purpose, the overall procedure and setting may vary somewhat. If the purpose is to present information, for example, the procedure used should enhance student retention and possible note taking. If the purpose is to stimulate the group and lead to possible discussion, care should be taken to see that the setting used does not have a negative effect. Overall, this method is probably one of the most widely used and easily adapted strategies.

When using this method, the instructor must consider the appropriateness of the content, organize the materials, pace the delivery, be sensitive to learner needs, interact as needed, and make any necessary midcourse corrections. In addition to playing the role of a transmitter, the lecturer serves as a stimulator of thought and observer of student behavior. In addition to fulfilling the role of receiver, students are questioners and challengers of the material presented as well as organizers of the information.

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Because the lecture is a relatively noninteractive type of learning strategy, the nontechnical skills that can be developed are more limited than some of the other methods. Listening and note-taking skills can certainly be practiced, and, depending on the structure of the lecture and the amount of time spent on questioning and discussion, other nontechnical skill areas may be involved. Although this method can help to explain "participative work environment" skills to students, additional learning strategies are required to give them skill in practicing these competencies. Lectures can also prove to be an effective way to convey the more cognitive type of knowledge related to business organization and management skills (objective #8).

The lecture/discussion method is commonly used in the automotive area since it allows the instructor to address major units of information and to summarize them for a large number of students. In the preparation of the lecture for automotive students, the instructor must allow time for question and answer sessions, which encourage students to analyze information and present their viewpoints. This approach helps students develop their reasoning skills (objective #7). However, one thing the automotive instructor needs to remember is to keep the students involved. Some students become bored with long speeches. (So does the instructor, for that matter.) By presenting a few facts at a time and by having students interpret them immediately, the instructor can hold students' interest—at the same time meeting objectives.

Demonstration Method

Demonstrations normally focus on how something works, how it is made to work, what makes it work, and what happens in the process. Although demonstrations are used primarily in manipulative types of instruction, they are also effective communication tools for both cognitive and affective learning; that is, one can demonstrate both manipulative skills as well as concepts and principles. More often than not, this method involves such additional approaches as lectures, observations, and discussions. The method usually involves some actions, procedures, techniques, and information giving, coupled with vivid communication that goes beyond simply verbal explanations.

Several procedures should be considered in arranging a demonstration, for example, establishing expected outcomes, planning (time, space, equipment, materials), preparing students, preparing the environment, conducting the demonstration, and developing follow-up and evaluation activities. The most important responsibility of the person conducting the demonstration is to communicate either by talking, using a chalkboard, drawing or illustrating schematics, or, in some cases, projecting information (pictures, cutaways, enlargements). Manipulation also occurs through the use of tools, machines, materials, and related objects. The students' activities mainly relate to sensory involvement with the demonstration (seeing, touching, and so forth), analysis of elements and components, and application and use of the information in related projects.

In this approach, the instructor—to enable students to perform according to the requirements of the demonstration—usually fulfills the following roles: interpreter of materials, challenger, stimulator, helper, and assistant. In turn, student roles often include helping to conduct the demonstration and serving as a co-demonstrator along with the instructor.

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The demonstration is one of the most commonly used teaching strategies in automotive programs. Literally every skill that is taught involves using this approach. Step-by-step operational procedures as well as safety procedures have to be illustrated and explained to the students.

By means of such demonstrations as assembling a Simpson Gear train in an automatic transmission, not only can technical skills be taught but important nontechnical skills also can be developed. For example, after performing the demonstration, the instructor should select students to report on the demonstration, thus supporting the development of both planning skills (objective #5) as well as communication skills (objective #6). During the reassembling of the gear train, the students' reasoning skills (objective #7) are developed in that they must recall facts and information accurately. This objective can be attained by asking sharply focused questions that require exact responses.

By having students present demonstrations in small teams, group process skills (objective #2) can also be sharpened. In order to complete their assigned tasks, the students must cooperate with each other. By having them explain to the class the step-by-step assembling procedures and safety precautions, communication skills (objective #6) are developed. Students also gain self-confidence by demonstrating real-life tasks to their peers.

Show-and-Tell Method

The "show-and-tell," or sharing method, is by no means limited to the primary grades! (It is quite similar to the demonstration approach—but there are differences.) It has wide and varied applications at all levels. The essential ingredient is that the activity starts with a relevant experience and ends with the student sharing it. This approach involves a great deal more than merely presenting and discussing. It offers a meaningful, firsthand experience to the involved learners. Also, it often exposes students to a totally unique experience. Usually, students evince a strong attachment to the subject to be shared; this attachment may represent a high degree of expertness on their part. In short, this method involves students in sharing their knowledge with others. Such sharing may include the use of a wide variety of media, apparatus, or artifacts. This method, which provides a means for integrating manipulative activities with communication skills, may be part of a planned program whereby students discuss how and why they made a particular project, what was learned, and what special insights grew out of the activity.

Show and tell can be used with a minimum of instruction in technique. It may be used alone, as a reporting device, or with other approaches. Generally speaking, the following steps should be considered: discuss the necessary planning procedures and evaluative criteria, conduct the presentations within the established guidelines, and evaluate the results.

Instructor roles, in general, include facilitating the students' development of their own materials and stimulating them to achieve even deeper involvement in the topic. Student roles include planning, securing information, organizing presentations, clarifying items, answering questions, and assisting other students in similar presentations.

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This method can be very effective not only in presenting material, but also in allowing students to develop their planning and communication skills (objectives #5 and 6, respectively). Most automotive students enjoy reading *Motor Trend* and *Hot Rod*. These magazines are usually full of service tips and new product information that students share with each other. Instead of them doing this informally, the instructor, from time to time, should allow students to develop a lesson to present to the rest of the class based on their reading. The instructor's job is to aid the student in organizing an appropriate lesson, deciding what materials (if any) are needed, and selecting the format for the presentation. At the end of the presentation, the instructor should allow time for discussion. As noted, this activity will aid students in developing their planning and communication skills, particularly if the instructor selects students who need to sharpen these skills.

ADDITIONAL INSTRUCTIONAL APPROACHES

Project Method

Sometimes the principle behind the project method is referred to as an "application integrator," that is, the project itself is a means of implementing—and applying—a number of related learnings. The purpose of the method, in brief, is to add more "reality" to the subject matter and to reinforce the learning that has taken place. A number of variations are possible: individual, small-group, large-group, and class or total school projects.

The procedures for carrying out this method vary. However, some of the general steps include determining goals and objectives to be attained (including affecting student behaviors) introducing the method, establishing criteria for selecting a project and the ground rules for conducting it, setting standards of performance, presenting the results either orally or in writing, and evaluating the project.

The main roles for the instructor are as follows: explaining the nature of the process, guiding the students, facilitating work with respect to resources and materials, challenging and questioning, monitoring activities, and evaluating the performance. Student roles vary depending on the size of the group involved. In large groups, students may be divided into committees, each with its own goals. A common technique for dividing the project work load of smaller groups is to assign each student individual responsibility. The student roles normally include conducting the project, interpreting the project to the instructor and the class, and formulating conclusions.

Most projects either are developed by the instructor to fit situational requirements or are found at the end of chapters in texts and workbooks. This simple fact does not imply that the project method is unimportant; it does, however, underscore the fact that project specifications often require the student to know some basic information. Therefore, putting project activities at the end of a textbook chapter or workbook is quite logical.

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It is feasible to devise projects that would enhance the development of every nontechnical skill since the project method has so many variations possible. Although all of the variations, from the individual project to the school project, can develop organization and management skills (objective #8), the projects designed for more than one student will best develop group problem-solving skills (objective #3). In group projects, students have to work together, cooperate, communicate, and make joint decisions if the project objectives are to be achieved.

In the automotive program, students normally are not assigned "projects" as such. However, they are assigned automotive repairs and similar tasks that must be performed. Hence, the principles of the method can be employed throughout the training program. Further, students can be

given a chance to earn extra credit by developing additional mock-ups for the program—assuming they possess the skills needed to develop a quality engine made up with cutaway views. A brief illustration of such an assignment follows.

Assign a group of students a project that involves building an engine mock-up with cutaway views. The instructor should supply the general information on what the engine is to represent and how it should be used. The student's job is to design drawings and plans to build the engine. The instructor should work as a facilitator in helping students complete their tasks. The students, in turn, have to decide which parts of the engine should be cut to expose the internal working parts and how those parts work together. They then have to make arrangements to get the parts cleaned, cut, and painted in order to make the mock-up into a good visual. Next, they must design a worksheet that would quiz students on the mock-up and its operation.

By working as a team, students will learn to share responsibilities and coordinate their efforts. In this example, they had to decide on how the engine was to be cut, assembled, and painted in order to achieve the best overall use of the mock-up. They also had to prepare a worksheet that other students would complete when studying the engine mock-up. During such an activity, the students not only can earn extra credit, but they also provide the shop with a valuable tool that can be used with future students. The process undoubtedly assists the students in developing planning skills (objective #5) and reasoning skills (objective #7). The example is just one illustration; the types of projects that instructors can use will depend on the specific goals of the program.

Problem-solving Method

Although the problem-solving method has unlimited applications in many vocational and technical areas, it is often used as a supporting activity with other approaches. Whether there is extensive use of this method depends on the instructor. If the instructor is inclined to provide most of the answers, there will be minimal use of this approach; if an instructor desires more decision making on the part of students, the method will be used more extensively. Although problem-solving processes are fairly complex, it is important to remember that often the processes by which one arrives at an answer may be more important than the answer itself.

Although a number of different problem-solving procedures exist, the following four-step process is commonly described: statement of the problem (to allow a wide range of possible solutions), brainstorming (again, to secure many possible solutions), judgment (close examination of all the ideas directed toward an optimum solution), and application (putting the proposed solution to use). Another description includes the following steps: identifying the problem, clarifying the dimensions, studying possible causes, developing possible solutions, testing appropriate solutions, and applying and evaluating the selected solution.

Using the problem-solving method, however, is not simply a matter of following preordained steps. The functioning of the method depends heavily on how the instructors and students see their respective roles. The method is at its best when the problems to be solved are identified by the students. Hence, the initial role for the instructor is to sensitize students to problems with which they can deal. The most important instructor roles include describing the nature of the strategy, presenting examples of problems other classes have addressed, assisting students in selecting problems with which they will be involved, interpreting procedures, providing advice and counsel, and evaluating performance. The students' roles relate to conducting the actual activity; hence, they assume a major function in all of the problem-solving activities noted.

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The problem-solving method comes into play primarily in teaching students to troubleshoot automotive malfunctions. The approach is intended to assist students in developing the ability to look at a situation, locate a problem, and find the means to correct it. This approach, in fact, should be used in all phases of the automotive curriculum, from the simplest task to the most complex. That is, the students should be required to look more closely at what they are doing to locate an existing problem and plan what is needed to make the corrections. For example, let us suppose that a team of students is assigned the task of rebuilding a transmission. As the students disassemble the unit, they should be instructed to follow the disassembly procedure in the service manual—which may or may not move from the simplest cause of the problem to the most complex. After the problem has been identified, the students must decide what is required to make the needed corrections. The instructor's job is to guide the process and help students develop problem-solving skills (objective #3). The less information the instructor presents, the better, since this approach puts more responsibility on the students' shoulders as they seek the needed information. (Note that systematic diagnosis normally should occur before disassembly; that is, students receive a troubleshooting chart prior to the disassembly. Some undoubtedly may be able to hypothesize what the problem is and, hence, may or may not have to disassemble the transmission.)

When actually given the opportunity to disassemble a unit and troubleshoot it, students will be practicing the most important skill needed to function as an automotive technician, namely, the ability to locate problems and decide correctly what repairs are needed. These activities, however, probably will challenge the automotive instructor's teaching ability, since not all students seemingly have the ability to look for and find a problem. Nevertheless, if students really want to become automotive technicians, they must be helped to develop problem-solving skills.

Discovery Method

Students derive comprehension of various phenomena by direct involvement in a sequence of events, including observing, internalizing, formulating, and concluding. Discovery is the result of an individual's—or group's—involvement that permits a discovery to surface. In terms of instruction, the method uses different degrees of planning: a formal, structured experience with identified, expected outcomes and an informal, unstructured experience with unpredictable outcomes or results. Among the general goals of the method are a greater understanding of oneself, of the relevant elements (materials and processes) involved in a laboratory environment, and of the human environment in which one lives.

The procedure by which the discovery process is carried out varies, depending on the instructor and the nature of the activities. However, two basic forms can be identified: the informal and the formal approaches. The informal process has no precise structure. The discovery element is actually an additional phenomenon added to existing experiences. This process functions best when students are encouraged to develop an awareness of what happens when performing a task. Instructors stimulate such awareness by having students respond to questions regarding what they have observed or discovered. The formal process has the discovery of new information as a primary activity, that is, the desired information is identified, a plan is developed (and executed) for securing the needed information, observations are made, important factors are identified, and conclusions are drawn.

A number of specific activities can be identified. Instructors must try to encourage students to carry out the following functions: observing, discerning, relating, and generalizing. To facilitate the process, instructors can raise specific questions, thereby stimulating relationships between existing knowledge and the new elements in one's experience.

The instructor's primary role is to assist students in establishing a frame of mind for examining materials, processes, and events in terms of their qualities, causes, and effects. "Discovery sensitivity" may be developed by directing questions regarding the student's work, for example, "What did you observe when carrying out the task?" The following are areas in which instructors can assist students in the formal approach: identifying goals, planning activities, developing observational capabilities, organizing and analyzing information, and developing appropriate conclusions. In the informal process, student roles involve observing, identifying, organizing, generalizing, and concluding. In a more formal method, students take on similar roles but in a more direct manner, for example: establishing objectives, planning procedures, executing an action plan, observing outcomes, recording observations, synthesizing data, and drawing conclusions.

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The discovery method can be used at any time when students are involved in performing assigned automotive tasks. Both the structured and unstructured approaches allow the instructor a great deal of flexibility. The method, which can be used by itself or in combination with other strategies, allows students to develop far more than just automotive-related skills. It also enhances the development of problem-solving, decision-making, and reasoning skills (objectives #3, 4, and 7, respectively).

During *any* lesson, *any* demonstration, or *any time* students are performing their tasks, the principles of this method can be incorporated; it is relatively easy to do so. As the instructor, you should ask specific questions regarding what the student is actually doing, for example, "What did you actually see while you were working on that radiator?" With the proper focused questioning techniques by the instructor, students can sharpen their observational, organizational, and generalizing abilities, all of which are necessary for automotive technicians to be able to perform their jobs.

Individualized Instruction and Performance-based Instruction

Although individualized instruction has been defined in many ways, the process normally includes specification of objectives in terms of observable competencies, a detailed diagnosis of learner characteristics, provision of alternative instructional procedures, and continuous assessment of learner progress. Students are provided the opportunity to progress at a pace suited to their abilities and styles. Since the approach allows students to learn at a variable pace, entrance into and exit from the program is often flexible.

Procedures vary according to the differing types of individualized instruction. For example, the following types can be identified: *individually diagnosed and prescribed* (the objectives are determined by the instructor who also selects the media to be used in learning); *self-directed instruction* (the objectives are determined by the instructor, but students select the medium and method of learning); *personalized* (students determine the objectives with the assistance of the instructor); and *independent study* (students determine the objectives as well as the medium and method of instruction). In addition, performancebased instruction is also relevant and will be discussed in more detail.

In the individualized approach, the instructor becomes the learning manager. This role entails diagnosing learning problems, suggesting alternative activities, serving as a consultant, and performing evaluation activities. Recognizing the difference between students, the instructor must deal with each person separately. It is also important that students understand their roles, since they too become active participants in the process. Responsibilities—such as assuming responsibility for maintaining a proper learning environment—must be assumed by each learner. Students must also learn to manage their time and participate in the decision-making process by selecting appropriate instructional methods that will enable them to accomplish their objectives.

Performance-based instruction is a term heard more and more these days. "Several performance-based resources are available."* The following is a brief overview. The approach has five essential elements: (1) competencies to be achieved are carefully identified, verified, and made public in advance; (2) criteria to be used in assessing achievement and the conditions under which achievement will be assessed are explicitly stated and made public in advance; (3) the instructional program provides for the individual development and evaluation of each of the competencies specified; (4) assessment of competency takes the students' knowledge and attitudes into account but requires actual performance of the competency as the primary source of evidence; and (5) progress through the instructional program is at the student's own rate when they demonstrate the attainment of specified competencies.

The desirable characteristics of performance-based programs are as follows: instruction is individualized as much as possible, rather than group paced; learning experiences are guided by frequent feedback; emphasis is on helping the student achieve program exit requirements; instruction is individually paced rather than time based; instruction, to a considerable extent, is field centered and based on realistic work situations; and instruction is often modularized and uses

*For more details, see R. E. Norton, *CBE: A Humanistic and Realistic Approach to Technical and Occupational Education for the '80s* (Columbus: The National Center for Research in Vocational Education, The Ohio State University, n.d.). See also the Performance-based Teacher Education (PBTE) module, K-1, *Prepare Yourself to Implement Competency-based Education* (Athens, GA: American Association for Vocational Instructional Materials, 1985).

materials with both required and optional learning activities to provide for different learning styles. More time is needed for the instructor to develop materials, work with individuals and small groups, and assess students; less time is needed for lesson planning, lecturing, and large-group discussion.

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Individualized instruction can be used in the automotive curriculum to facilitate all students' learning. Since few people progress at the same pace, this approach allows students to learn technical information at a speed permitting them to practice each task until they reach a specified level of performance. Since all tasks should be taught with the principles of competency-based instruction in mind, the students should work on a particular task (e.g., using the engine analyzer) until they become competent in that area.

For automotive instructors, most work will be in the developing of program content and deciding what methods and media will provide enough variation to allow students to reach their individual potential. All phases of the curriculum—from engine servicing to business practices and organizational skills—can be taught within the context and principles of performance-based instruction.

Students, working individually, should be encouraged to arrange their time in order to assemble the needed materials, make decisions about the approaches needed to carry out their assignments, and determine where to find additional information. Also, they will develop the ability to interpret written information along with the ability to relate that information to others. As students progress through the performance of their various tasks, they must set realistic goals, working with the instructor so that they can perform each task to a specified level of competency.

The time involved in performance-based assessment is a major concern. For example, it takes a good deal of time to evaluate students individually. Another drawback to this method is the lack of student motivation. Some students are seemingly not mature enough to handle the responsibility that comes with this approach. But if the program is used properly, many students will learn to develop skills in problem solving, decision making, and reasoning (objectives #3, 4, and 7, respectively).

Contract Method

In the contract method, the central teaching and learning principle is an agreement between students and the instructor. Although the contract itself may specify a particular form that the contract fulfillment may take, the degree of specificity is worked out between the parties involved. This method, as noted, is an agreed-upon arrangement between the students and instructor with respect to the proposed accomplishments of the students and the reward system established for these accomplishments. It may be used either with a single student, a group of students, or with the entire class. The main purpose is to establish a direct link between the students and the instructional programs—in terms of what students study and how the studies are carried out. The contract method is suited to a wide range of learner interests and abilities.

The following procedures are most important: providing background information about the nature of the method itself; planning the contract, including the extent to which students agree to perform, the time limits, and the expected rewards; negotiating the contract so that each party knows what is expected; and modifying the contract in situations where changes need to be made, for example, scope of coverage, time requirements, performance standards, and rewards. The main activities relate directly to the contracting aspects of the experience and are used to fulfill the commitments of the contract. For example, the former category includes planning, negotiating, contracting, and modifying; the latter category includes an endless variety of activities in fulfilling the contract: reporting, designing, constructing, demonstrating, comparing, identifying, and so on.

In some respects, instructor and student roles are similar. The instructor is normally the major planner (setting goals and purposes, providing forms and contract guidelines, establishing evaluation and reward procedures), negotiator, contractor, facilitator, and evaluator. Students, similarly, fulfill the roles of planner (what is to be done and how it is to be accomplished), negotiator, contractor (making a commitment to perform), and modifier. These roles are similar to those that students will be required to perform many times throughout their lifetime.

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Although the contract method can be very effective—particularly with more motivated students—the strategy requires a good deal of time for preparing and setting up. Once the objectives and roles have been established between the instructor and students, most of the task is completed and the students' work can begin. Although the method is used primarily with students who have good self-discipline, it could be used to develop these skills in other students. Students could also develop skills in interpersonal areas (objective #1) and in group process areas (objective #2), depending on whether the contract is used with a group.

By having students help develop contracts that prescribe the amount of information to be learned, the level of achievement to be reached, and a designated time in which to perform the objectives, the students should not only learn the necessary automotive skills but should also develop decision-making and planning skills (objectives #4 and 5). They will learn how to work effectively when time and pressure are critical factors, how to be responsible for their own judgments and actions, and how to work without close supervision.

In the automotive curriculum, most duty areas have more than one skill to be performed. By developing contracts with students for these areas (e.g., engine reconditioning or electrical systems), the instructor can group similar skills to be performed into one contract. By using self-appraisal skills and progress charts, students can learn to check their own achievement. This approach allows students to decide whether they can fulfill the contract or whether they need to suggest any contract changes. Decision-making skills are likely to result from this activity.

Lastly, the one-on-one approach seemingly works best with automotive students. This allows greater individualization of instruction. If done carefully, the benefits of this approach will outweigh the time and effort needed to put it in place.

Peer Teaching and Peer Tutoring

Using students as teachers and tutors is becoming more common—from the elementary school to the graduate school. The growing popularity of this approach appears to be based on the increased acceptance of the view that students are more than passive receivers of instruction. Peer teaching and tutoring and using students as teachers are accepted ways of providing opportunities for more advanced students to become involved with their learning. Peer tutoring, particularly, is an acknowledged means of promoting individualization, since it allows learners to spend more time in one-on-one situations. Both tutors and learners have an opportunity to learn in a noncompetitive atmosphere. Although learning from one's peers should be an ongoing process, organized peer tutoring has not been regularly included as a planned classroom activity. Nevertheless, this method is usable in a variety of situations, limited only by one's imagination.

When establishing these types of programs, instructors need to consider the following: specifying and assessing outcomes, specifying procedures and materials, training student assistants, and monitoring their activities. Selecting tutors and learners, matching "pairs," and determining the number of student assistants are also essential activities.

It is important that students who participate in peer tutoring be given sufficient orientation. Instructors must be certain that the assistants are knowledgeable about the concepts or facts they will be presenting. A good training technique to use is role playing. During these sessions, student assistants should be asked to focus on finding alternative ways of explaining concepts and encouraging learners to complete their assignments. They should also be taught how to ask questions and give positive reinforcement. Adhering to a lesson plan and providing a positive role model should also be stressed. Another training task is to teach tutors to give appropriate corrective feedback, that is, to acknowledge correct answers and give the learner a chance to provide correct answers.

Instructors need to make certain that student assistants have the necessary resource materials. They also need to evaluate the assistants and aid in self-evaluation. Training and monitoring cannot be stressed excessively. The former should prepare the assistants for exactly what they will do when they sit down to work with learners. Instructors must also provide assistants with a well-defined set of assignments and demonstrations on how to use the instructional materials. Monitoring to observe how well the assistants are handling the situation should occur regularly. The assistants, in turn, need to plan their work carefully and take their responsibilities seriously.

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Peer teaching and tutoring can be an asset to an automotive program, particularly if the proper students are identified to use this method. However, instructors need to chose tutors from the more mature and responsible students in the class.

Perhaps the hardest part of peer tutoring is forming an effective student-tutor team. Because of personality differences in students, instructors may have to try more than one tutor with a particular student before finding a working match. Instructors must also make available all notes, handouts, worksheets, computer software (if applicable), and well-defined objectives that will enable the tutor to help his or her fellow student.

This approach, which allows for one-on-one interaction, assists students primarily in developing planning skills (objective #9) and communication skills (objective #6).

Simulation and Role Playing

Simulation—and role playing—are basically the enactment of lifelike conditions in which students—on an individual or group basis—carry out selected roles as part of the learning experience. The degree of structure depends on the event being simulated; it may involve students' assuming the duties and responsibilities of a particular person associated with an organization (a business or industry) or it may require a group of students' portraying a specific situation in order to simulate meaningful discussion. The method encourages participation, helps students discover how people might react under certain conditions, and generally provides a greater degree of realism in and involvement with the learning situation.

Because of the variety of circumstances in which these approaches can be applied, no set routine exists for a simulation or role-playing activity. Activities can occur spontaneously or as a result of prior planning. Nevertheless, certain considerations should be kept in mind: the goals must be clear, the activities should be as realistic as possible, and the students must be involved in a meaningful way. After completion of the activity, a discussion may help the students understand why some solutions are better than others, why certain options were offered, and what the results of those actions were. Such discussions help develop reasoning, judgment, and decision-making skills.

The instructor serves mainly as a resource person and manager of educational experiences. The role will vary, depending on the simulation; but generally it includes facilitating the students' involvement in research, planning, and organization; advising on procedural matters; providing feedback; and evaluating performance. Learning objectives, both technical and nontechnical, need to be clearly established and understood by the students; the time frame in which the work is to be completed should be understood. Although specific student roles will vary with each activity, in general, the student will plan, organize, and execute the assignment as dictated by the simulation setting.

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The simulation or role-playing method provides an excellent approach for developing many nontechnical skills. Depending on the simulation, the skills involved will vary; however, the method could prove helpful in developing such skills as those used in group problem solving (objective #3). Interpersonal skills (objective #1), such as learning to work effectively under time constraints and taking responsibility for one's own decisions and actions, are practiced in many simulations. Since simulations usually require more than one participant, group process skills (objective #2), as in working as a member of a team and helping a group reach a consensus, can be developed. Students also can gain experience using many decision-making skills (objective #4), depending on the requirements of the simulation. Communication skills (objective #6) can be practiced, as well as such skills as carrying out instructions, recalling information from memory, and other reasoning skills (objective #7). Lastly, the methods can also be used effectively to develop organization and management skills (objective #8).

Here are two brief specific examples of how the approaches might work in the automotive workshop.

In one situation, a shop mock-up or vehicle could be made to simulate a certain malfunction (for example, a high speed vibration). The student, or a team of students, could "troubleshoot" the malfunction and determine what types of repairs are needed to return the vehicle to manufacturer's specifications. During this task, students would have to work together to solve the simulated malfunction, identify the existence of a problem given a specific set of facts, and determine what activities would accomplish their task.

In another case, several students could be selected to assume the roles of the different personnel in a repair shop as well as that of a troubled customer who has a very specific complaint. After the role playing, let the rest of the class respond to what transpired. Ask for their interpretations of the situation as well as alternative ways in which the matter could be handled.

Instructional Worksheet Method

The term *instructional worksheets* applies to a number of related items: information sheets, job sheets, operation sheets, and assignment sheets. Since such worksheets normally are developed by the instructor or a group of instructors, the formats vary. However, information sheets generally consist of one or more pages of information related to a particular topic; assignment sheets are printed and graphic presentations setting up work to be accomplished; operation sheets contain steps, procedures, equipment, and materials needed to perform a function; job sheets contain printed and graphic terms intended to aid an individual in carrying out a job or project. Instructional worksheets can be valuable in that they provide students with background materials that support discussions and demonstrations, assist students in independent studies, supplement the normal instructional program, and aid students in preparing for examinations.

When preparing instructional worksheets, instructors need to be alert to the following problem areas: information beyond the student's level of understanding, too much detail, a reading level that is either too high or too low, incomplete illustrations, the inclusion of too many topics, inaccuracies appearing in the material, unappealing format, and out-of-date content. All of these considerations should be attended to when developing worksheets.

The problems listed here should serve as guidelines for both preparing and using such materials. For example, instructors need to make certain that the information is understandable, readable, accurate, and up-to-date. Moreover, they should use these materials in moderation. Worksheets should be considered as "desserts" rather than the "main course." As such, these often are valuable when used for homework assignments, supplementary learning, and enrichment activities.

The following problems also should be taken into consideration when using these materials: instructors sometimes tend to make excessive use of these sheets; they sometimes dismiss students' inquiries by referring them to the sheets for answers; and they sometimes structure the program around providing worksheets without considering the students' needs. Instructors and students alike need to avoid using worksheets as a crutch. Above all, these materials should never be used for busywork.

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Instructional worksheets—either the commercial variety or those prepared by instructors—are useful resources in an automotive curriculum. Most commercially prepared worksheets come in workbook form or are packaged as part of a complete automotive curriculum. However, for most instructors, preparing one's own worksheets results in greater flexibility in that the materials fit into the ongoing program more closely. It also enables instructors to infuse relevant nontechnical skill objectives.

The use of such worksheets in laboratory environments allows students to work at their own pace and to develop decision-making skills (objective #4) as well as self-discipline skills. When using the worksheets with textbooks or shop manuals, students often exercise problem-solving skills (objective #3) needed in an automotive repair shop. For example, consider the installation of

a rod bearing and the checking for proper tolerances. The instructor gives the students a worksheet with basic directions, including where to look for specifications and related information; students are then instructed to follow the directions in order to complete the assigned task. The instructor moves from workstation to workstation, evaluating progress at each stop. By asking specific questions, explaining directions, and interpreting the results, the instructor works with each student in order to achieve the desired objectives.

Case-Study Method

The case-study method consists of students' examining all dimensions of a real—or theoretical—problem and projecting possible solutions based on data collection. Case-study problems of actual experiences are an effective learning strategy. Students seem to work harder on analyzing real situations. The purposes of this approach are to assist students in recognizing that a single problem may have many potential solutions and to enable students to develop their analytical capabilities. Case studies can be used to illustrate a point, get an entire group thinking about a specific problem, or encourage discussion.

Case studies can be used with individual students, small groups, or an entire class. Regardless of the group size, the procedure remains the same: problems should be isolated and clearly defined, an analysis should be made of the factors that contribute to the problem, relevant information should be compiled, alternative solutions should be determined and examined, and the best solution should be proposed and evaluated for its effectiveness in solving the problem.

The best alternative a group can come up with in a particular case would be, of course, a correct solution; however, case-study problems often have no right or wrong answer. Care should be taken, therefore, to ensure that the setting provides for optimal student discussion and group interaction. Adequate time to complete the case study should be allotted if the best solution is desired as the outcome. Students need time to consider each of the alternatives. Since case-study problems vary in their length and involvement, time requirements will differ. Generally, case-study activities take place in lab areas, although sometimes the pursuit of a solution may take students beyond the school setting. Students have a great deal of opportunity for involvement since—to a large extent—they engage in self-directed activities and are provided with considerable opportunities to apply ingenuity and resourcefulness. In short, the major activities include identifying problems, making decisions, weighing the relative merits of proposed or projected solutions, and applying proposed solutions whenever appropriate.

The instructor's main roles are as follows: providing background information and explanations, clarifying the problems, maintaining direction and focus on important issues, providing guidance in decision making and problem solving, and assessing the appropriateness of the solutions. Student roles include assisting in developing the background of the problem, suggesting possible solutions or courses of action, deciding on actions to be taken, applying the proposed actions to the problem, and evaluating the results of the actions.

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Case-study problems, in general, provide an excellent means of infusing group problem-solving skills (objective #3). Since many case studies are used in a small-group setting, such skills as working as a member of a team, showing empathy, and learning to resolve a problem can be practiced. Depending on the size of the group, each student's problem-solving and decision-making skills (objectives #3 and #4) can be developed to some extent. (Large groups obviously provide less chance for interaction.) Oral communication skills (objective #6) can also be practiced with the case-study approach, especially if group reports and class discussions of solutions are used. Not only do case studies provide an excellent means of generating class discussion, they can also be used to determine what students have learned from a particular unit.

One specific use of this approach is to have students prepare a job plan consisting of job steps and sequences. Allow them to prepare a flat rate job estimate sheet for a specific automotive repair. By preparing these materials, students begin to develop both planning and reasoning skills (objectives #5 and 7).

Another idea is to divide the students into groups and assign each one a different automotive malfunction. Each group must decide what types of repairs are needed and what repairs should be attempted first. Each must also prepare a written price estimate for the customer. Working as a team, the students will have to decide who will be their group leader. The leader then will need to assign other members to develop the specified plan and repair estimate. The students will have to coordinate their activities with each other. These tasks should help them develop group process skills (objective #2).

As students complete the job plan and estimate sheet, they will have to decide the exact steps needed to repair the car as well as the sequence in which to do so. They also must prepare a written estimate based on the job plan. During this process, the students should be reinforcing their planning and reasoning skills. After they have completed the job plan and written estimate, they should share the methods they used to complete their assignment. This activity will allow them to become acquainted with the different approaches used. The activity will allow students to expand their communication skills (objective #6) in addition to their planning and reasoning skills.

Business Enterprise and Entrepreneur Approach

The business enterprise and entrepreneurship approach is a form of instructional organization that involves integrating various approaches. The method assumes the dimensions of a business enterprise that starts with forming a company, selling stock, developing a management organization, selecting and designing a product, surveying the market, producing, packaging, marketing, redeeming stock, and dissolving the company. Its greatest value is that the method relates to real situations found in business. Many opportunities exist to develop leadership, responsibility, social interaction, cooperation, and communication skills.

The following topics should be taken into consideration: the instructor's capability, the student's background and experience, the institution's philosophy and regulations, and the classroom's physical adaptability. The instructor's capability relates to such issues as handling the flexibility that is needed in this somewhat open-ended approach. The student's background must be considered in terms of interest and sophistication. The overall school philosophy is also a factor, particularly regarding the degree of freedom in student decision making and leadership that is commonly needed in such a program.

The instructor's role includes introducing this activity and, particularly, assessing the students' readiness. To accomplish this, instructors normally present films on the approach, conduct field trips to show students the approach in action, act up visits to industrial plants having the essential components that need to be understood, and invite guest speakers from business and industry. The approach also involves a great deal of student control, leadership, and responsibility.

Some important questions that the instructor must answer early in the process are as follows: Should the entire class participate? Does the program (the business) operate during or outside of class hours? What should the relationship be to other businesses in the community that offer similar products or services?

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Although this approach is more likely to be found in marketing and distributive education, automotive instructors should not discount it out of hand. The business enterprise or entrepreneurship approach allows for the development of many nontechnical skills. Every stage of the company's operation can serve to provide training in organization and management. Even the scaled-down classroom version of a business enterprise will allow students to encounter many of the problems of its real-world counterpart—a perfect setting for developing participative work environment skills.

While setting up the company and selecting a management structure, the students will practice decision-making skills (objective #4). Throughout the company's existence, they will use group process and problem-solving skills (objectives #2 and 3) as they learn to work as team members. Students will experience different kinds of supervision, learn to work effectively under pressure, and learn to plan and carry out activities. In this learn-by-doing method, students will use many organization and management skills (objective #8); they learn firsthand about supply and demand, productivity, and economics. Lastly, they can experience personally how quality control is vital to a profitable business venture.

Unit Approach

The unit approach is a type of instructional organization rather than a teaching method like the project or contract method. However, it cuts across other methods, since it implies a strategy that can tie the learning process together. The approach usually involves groups of students working on activities that aim for goals not possible in more discrete programs. Units, in brief, identify subdivisions of larger topics that students might pursue in depth. The value of this approach is that it enables students to become experts in and meaningful contributors to topics of interest. The variations available in the approach provide students with numerous opportunities for their unique talents to be demonstrated.

The procedures involved in carrying out a unit study include dealing with such important initial questions as, Have you, as an instructor, prepared the students to assume self-direction, and have you ensured that they have sufficient resources to "pull it off"? Other procedures include introducing the approach, conducting the unit, and providing follow-up activities.

Instructors' roles vary according to the time period; that is, they are more highly involved in the initial stages since their primary role is to introduce the unit. This is usually done by identifying goals to be achieved and by describing how the approach works. The role then basically becomes one of leadership. Usually it involves providing resources, answering questions, establishing deadlines, and evaluating. Students, in turn, are responsible for selecting the specific topic of study, identifying concrete goals, and pursuing the study in depth. Follow-up is the joint responsibility of both students and the instructor; this activity results in the strengthening—through additional practice and increased involvement—of the behaviors and knowledge that are used in this approach.

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The unit approach has a place in a wide array of automotive instructional methods in that it allows students to develop their own interests in a content area beyond the point covered by the standard curriculum. Just as automotive technicians have service areas in which they specialize, students often have areas in which they would like to concentrate. However, because of the amount of information that has to be presented during a 2-year program, this method should be used along with the standard approaches. In other words, students working on a special unit will have to keep up with the rest of the instruction. This can be accomplished by the instructor's setting up units that allow students to work by themselves. By using various manuals, manufacturer's repair guides, and computers (if available), the instructor can assist students in becoming self-motivated. Although this method may require some time to establish, once the groundwork is completed, the main task of the instructor is to provide the necessary guidance for students.

This approach develops several nontechnical skills: interpersonal skills (objective #1) in that it allows students to work without close supervision, and problem-solving skills (objective #3) in that it forces students to identify further information needed and where that information can be found.

Miscellaneous Techniques

General Approaches

Automotive instructors can facilitate the development of nontechnical skills by using a little imagination. Simple considerations in such areas as teaching style and discipline techniques can aid in the infusion of such skills.

The automotive classroom provides many opportunities for the development of interpersonal skills (objective #1). For example, the class attendance policy can encourage students to show up on time for activities by reflecting attendance in their grades. Encouraging discussion can help students see things from another's point of view and at the same time help them develop reasoning skills (objective #7) in distinguishing between fact and opinion and in defending their own position. Providing students with extra-credit assignments, which are due in conjunction with a normal assignment, can help them learn to work effectively under time constraints. Students learn to be accountable for their own actions when penalties are incurred for coming unprepared to class.

In addition, student interaction and participation can be encouraged in the automotive classroom or workshop; all that is required is a little forethought. Early in the year, assigning the shy students to handle simple classroom management tasks can benefit their self-confidence and interpersonal skills. Asking uninvolved students to take on a special assignment can help develop nontechnical skills. Occasionally requesting students to read handouts out loud benefits the development of communication skills (objective #6), as does having students make phone calls to set up appointments or to arrange for speakers.

All aspects of communication—grammar, reading, writing, speaking, listening—can be developed in the classroom and workshop. Making a point to correct the students' grammar and spelling should be the task of every automotive instructor. Requiring that chapters or materials be read also helps develop communication skills. Note taking helps students learn to organize ideas effectively and improves written communication, as does corresponding with other automotive programs or writing thank-you notes to speakers. Oral communication skills are benefited by the use of group presentations as a learning strategy; arranging for the difficulty level of the presentation to increase as the year progresses is suggested.

As is evident from the previous discussion, nontechnical skills instruction can be infused into the automotive curriculum. It is important that instructors establish an atmosphere in which all answers are appropriate and no question is regarded as "silly." Role modeling is very important in developing interpersonal skills. Encouraging students to become a part of discipline and curriculum decisions whenever possible provides additional experience with democratic participative management techniques.

Audiovisual Approaches

Audiovisual instructional materials involve both the hearing and sight of the student and are effective tools to use in generating interest in a subject, in illustrating situations that are difficult to create in the classroom, and in helping provide additional information about a topic. Audiovisuals come in all shapes and sizes, but the most common ones are films, filmstrips, slide presentations, videotapes, and transparencies. These materials often help supplement a subject area and are readily infused into any curriculum. Many AV materials are not designed to stand on their own; often they can supplement some other type of instructional material—a textbook or workbook—or they may be used in group discussion to achieve their intended purpose.

Because most AV materials—especially films and filmstrips—are most effective when shown in their entirety in one sitting, the time factor is somewhat rigid for this strategy. Generally speaking, the major instructor roles are to operate the equipment and conduct appropriate discussion and follow-up activities; students generally practice their listening and note-taking skills until the conclusion of the presentation.

Since this strategy requires the hearing and sight of the student in order to be effective, the use of AV materials will develop listening skills, one of the many communication skills (objective #6). (In this regard, students should also be taught the skill of paraphrasing in order to emphasize the importance of understanding clearly the customer's version of an automotive malfunction.) Some AV aids, especially films and filmstrips, are written in such a way as to encourage reasoning and logical thinking (objective #7) and may help students develop their own opinions about a topic. Also, not only do audiovisuals help develop listening skills, they almost always make the subject more interesting by providing variety to classroom experiences. Undoubtedly, the effective use of AV materials contributes directly to the accomplishment of many teaching and learning objectives.

EXPERIENTIAL INSTRUCTIONAL APPROACHES

Cooperative Education

One experiential approach that deserves special mention is cooperative education. Through an arrangement with business or industry, students are provided experiences that enable them to develop occupational skills and knowledge. Although various types of programs have been developed, the following have direct implication for vocational and technical education: (1) cooperative vocational education—an instructional plan combining part-time employment and on-the-job instruction with learning experiences gained through vocationally oriented school instruction; (2) cooperative work training—experiences that enable students to develop into responsible workers (although workstations may not be in the occupation the student hopes to enter and need not be related to occupational courses being taken); and (3) work-study—a financial assistance program providing students with part-time employment.

The initial step is to find workstations that can provide the necessary job experiences. In choosing the appropriate station, several employers should be visited before making a selection. The following criteria should be considered: employers should understand the purposes of the program; a reasonable probability of continuous employment should exist; employers should have proper facilities to provide appropriate learning opportunities; students should receive the same employment status as other part-time employees (wages, insurance, and the like); and employers should provide adequate supervision. In addition, the job should provide useful training, not just routine activities; the workstation should be conveniently located; tasks should be within the range of student abilities; employers should have excellent relations with labor; and hiring, promotion, and dismissal practices should be consistent with program goals. In addition, a written training agreement, which lists experiences and skills that will be provided to the student on the job, is advisable. It should contain the following items: the number of hours the student is to spend on the job and the responsibilities of the student, employer, and educational institution. Additionally, everyone involved must understand and work within the framework of relevant local, State, and Federal labor regulations. Lastly, a major activity is supervision: follow-up calls, regular visits, and detailed record keeping must be conducted to assist students in making needed work adjustments and to evaluate the effectiveness of each student's experience.

The instructor-coordinator is a learning manager with responsibilities in the school as well as in the community. Primary roles include placing students at workstations, assisting students in adjusting to work environments, correlating classroom instruction with on-the-job training, assisting students in making personal adjustments, directing vocational youth organizations (if applicable), administering activities, and maintaining good public relations. Student roles include

attending work and classes regularly, performing both work and classroom assignments efficiently, conforming to regulations, and consulting with the instructor-coordinator about any difficulties they might be encountering.

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Although cooperative education as such is not widely found in automotive programs, a related approach called *early placement* is used. (State laws governing automotive programs will determine the types of experiential programs that can be followed.)

Even though the Industry Planning Council in cooperation with the Motor Vehicle Manufacturers Association and the American Vocational Association have set standards for cooperative automotive programs, such programs are not widely used—except in some rural areas. (See the resource section that follows.) However, a Diversified Cooperative Training (DCT) program can be found in many places.

Whereas a cooperative education program could be used in both the junior and senior year of an automotive program, early placement is used only in the last part of the senior year. Both programs are similar in their objectives; that is, they are designed to develop the students' automotive knowledge and experiences. In both programs, students are expected to practice the skills they have learned. Also, the instructor is expected to be in constant contact with the employer so that student deficiencies can be identified and overcome.

During early placement, students gain experience in working under personnel with various management styles. This experience allows them to develop numerous interpersonal skills (objective #1) by having them make decisions regarding what types of repairs are needed on the vehicles assigned to them. Similarly, students can develop various skills in problem solving and decision making (objectives #3 and 4).

Job Shadowing

Job shadowing is a structured, planned observation experience in which students spend time following—literally, shadowing—workers carrying out their duties on the job. The experience is without pay for a limited period of time. The length of the activity may vary from one day—or part of a day—to a week or more. The purpose is to provide students with firsthand opportunities to observe how specific work assignments are accomplished. Since the activity involves looking over someone's shoulder, it is recommended that job shadowing be an individual rather than a group project.

Prior to introducing the shadowing experience, instructors must attend to several tasks: writing letters and making calls or personal visits to the work sites to discuss the activities' purposes and procedures, planning the activities, and determining the type of record keeping needed. Instructors need to give careful attention to the concerns of the sponsors and should prepare their students for the realities of the workplace. Another important consideration is writing an agreement with the sponsor, specifying the length and conditions of the experience, any special insurance that might be needed, and so forth. Instructors must determine any costs involved and transportation needed.

For this part, students will need to develop questions to direct to the workers. Keeping a diary or log is a technique that will assist students in sharing their observations when they return. Students should be particularly alert to the actual tasks performed, the duties, and the equipment used on the job. Although at times they may feel the "urge" to participate, usually they should not expect to become involved with any kind of labor—unless specifically asked to do so.

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This strategy will work well particularly if the instructor has a good working relationship with the school's advisory committee and other employers in the community who are familiar with the automotive programs. The program also will need the support of both business and parents because of the concerns for insurance and possible transportation needs.

Working with the members of the advisory committee, for example, an instructor can arrange for students to see what an automotive technician's day is actually like. During the experience, students should be instructed to pay very close attention to how the technician determines what is wrong with the car and what must be done to determine the appropriate repair procedures. By watching the technician, the students will see how workers handle different situations. This should aid them in developing problem-solving skills (objective #3). They will also see that technicians often must work on their own with little supervision. After each visit, students should share their experiences with the rest of the class; the activity will help them develop communication skills (objective #6).

SELECTED RESOURCES

Resources on Quality of Work Life Objectives

Developing Critical Skills through Involvement in VICA

The Vocational Industrial Clubs of America (VICA) is, as probably every automotive instructor knows, a National organization involved in secondary and postsecondary vocational industrial education. This includes students in trade, industrial, and technical courses that are vocationally and occupationally oriented. The heart of VICA is the local vocational industrial club affiliated with the National organization through a State association. The club is a group of students in a single school who work cooperatively to develop their leadership abilities through worthwhile educational, vocational, civic, recreational, and social activities. Compare several of the following major purposes of VICA with some of the objectives of the quality of work life concept and a number of similarities can be detected:

- To foster a deep respect for the dignity of work
- To promote high standards in trade ethics, workmanship, scholarship, and safety
- To develop the ability of students to plan together, organize, and carry out worthy activities and projects through use of the democratic process
- To foster a wholesome understanding of the functions of labor and management organizations and a recognition of their mutual interdependence*

Interpersonal and Other Human Relations Skills (Objective #1)

Graham, G. H. *Understanding Human Relations: The Individual, Organization, and Management*. Chicago: Science Research Associates, 1982.

Chapman, E. N. *Your Attitude Is Showing: A Primer on Human Relations*. 4th ed. Chicago: Science Research Associates, 1983.

Chapman, E. N. *Put More Leadership into Your Style*. Chicago: Science Research Associates, 1984.

*From *Leadership Handbook* (Falls Church, VA: VICA, 1970), p. 62. For more information, write to VICA, 105 North Virginia Avenue, Falls Church, Virginia 22046.

Johnson, D. W. *Human Relations and Your Career*. Englewood Cliffs, NJ: Prentice-Hall, 1978.

These related books should be a welcomed addition both for persons in business and industry and for instructors who are preparing students to enter business and industry. While a number of books are available on the general topic of human relations, the book by Graham is especially relevant to the purposes of this instructional guide. The second and third sections of the text, particularly, hit our target. Section 2, "Organizational Aspects of Human Relations," includes valuable chapters on organizational structure (including authority and responsibility), small-group behavior, and climate and organization development. Section 3, "Managing Human Relations," includes important chapters on the role of supervisors, how to lead effectively, how to improve communication, how to improve decision making, and how to implement change.

Chapman's primer on human relations, now in its fourth edition, focuses both on understanding yourself and relationships with others. This attractive paperback (with a smiling Mona Lisa on the cover) is also sprinkled throughout with 20 case problems on such topics as decision, communication, confrontation, frustration, listening, hostility, and sensitivity—to cite only a few.

Chapman's newest book deals primarily with leadership and includes sections on management skills, becoming a better communicator, handling power with care, and learning to make decisions with confidence. It, too, has similar case studies throughout the text, plus a valuable appendix that includes the author's response to the case problems, a leadership assessment form, and a leadership communication scale.

Although somewhat older, the Johnson resource is still valuable. This guide to interpersonal skills includes an insightful discussion on job survival skills: cooperating and leading, communicating, forming good relationships, making conflicts beneficial, and resolving conflicts through discussion.

Attitudes and Professional Ethics

Corpsmember Activity Guides. Washington, DC: Job Corps, U.S. Department of Labor, dates vary.

Many of the Job Corps' training materials called "Corpsmember Activity Guides" or CAGs include detailed lists of training elements, required educational and technical knowledge, and a "job physical profile." A number of the CAGs include a list of 14 student competencies relating to attitudes and professional ethics. These items should be helpful as you establish your goals dealing with interpersonal relations and group processes:

- Demonstrate correct safety practices on the job
- Maintain appropriate personal hygiene and appearance
- Arrive at the job on time
- Be on the job every day
- Perform work of consistently good quality
- Function cooperatively with fellow workers
- Treat others courteously

- Work with even temperament
- Accept constructive criticism
- Follow instructions willingly
- Deal well with supervision
- Willingly work unusual schedules when required
- Handle proprietary information discreetly; respect confidences
- Respect worth of equipment, company, and personal property

You might wish to contact the local or regional U.S. Department of Labor Office in your area in order to find out where the nearest Job Corps Center is. No doubt you will wish to review their automotive curriculum materials; they are quite comprehensive.

Knowledge to be Developed and
Services to Business, Industry, and Society

> *Futuring of Occupational and Practical Arts Education: Discussion Outline May 1981-March 1983.* Albany, NY: Office of Occupational and Continuing Education, State Education Department, 1983.

Actually several documents in the series may have relevance to your interests: "Trade and Industrial Education Draft Recommendations" as well as "Technical Education Draft Recommendations." The titles of the documents describe the contents; that is, they attempt to project vocational curricula areas that a number of New York State educators believe they should develop over the next decade or so. The list of purposes of trade and industrial education, for example, includes the following items related to the nontechnical objectives in this instructional guide:

- **Knowledge to be developed**

  —Abilities in problem solving, communications, decision making, interpersonal relationships, and resource management

  —Technical literacy (e.g., conceptual understanding of computers, communication systems)

  —Practical application of communication and computation skills

  —Technical reading, writing, and mathematics skills that relate to a specific trade and industrial instructional program area

  —Knowledge of basic economics of business and industry
  —An awareness of and positive attitude toward change

- **Services to business, industry, and society**

  —Employability skills, such as promptness, dependability, self-reliance, and adaptability

  —Responsiveness to changing management structures

—Awareness of the role and responsibility of individuals, working alone and in groups, in shaping communities and society

—Improving people's ability to be effective entrepreneurs

—Promotion and support of the values of the American economic system (from the "Trade and Industrial Education Draft Recommendations," pp. 1-2)

In addition, the following comment on the curriculum continuum from the "Technical Education Draft Recommendations" is surely relevant to this instructional guide: "We suggest that much of the core (personal life skills, relationships, career development, etc.) can best be imparted in an infusion process rather than in 'stand alone' modules" (p. 3).

Problem Solving (Objective #3), Communication (Objective #6), and Feedback

Auto Mechanics: Preapprenticeship Phase 1 Training, Instructor's Guide. Eugene, OR: Lane Community College, 1979.

Although this guide was prepared at a community college, it also is useful at the secondary school level. Teaching outlines are provided for the various modules that comprise the course. In terms of this instructional guide, a number of points are relevant, including the following:

- **Group problem solving, goal setting and decision making**

  —Define the problem.

  —Look at the facts—what is happening, who is involved, when does the problem occur, why has it become a problem.

  —Agree on the goals.

  —Pool ideas for achieving the main goals.

  —Look more closely at some of the more interesting ideas.

  —Include other ideas that might be helpful.

  —Agree on guidelines for achieving the goals.

  —Decide on a plan to implement the proposed solutions.

  —Assess the likelihood of success.

  —Evaluate the success of the decisions after they have been implemented.

- **Communication skills**

  —Good communication—a two-way process with mutual respect

  —Active listening, e.g., centering attention on the other person and checking that you have understood what the other person is saying

  —A three-step approach: show you understand, take responsibility for your own feelings, and suggest alternatives

- **Giving and receiving feedback**

  —Importance of being able to give praise and criticism

  —Importance of group support and teamwork

  —Reading attitudes (interpreting other people's behavior)

  —Giving and receiving positive opinions

  —Getting and giving criticism

(Adapted from *Auto Mechanics: Preapprenticeship Phase 1 Training.*)

Group Problem Solving (Objective #2)

The following references deal with various aspects of group problem solving:

Cinnamon, K. M., and Matulef, J., eds. *Applied Skills Series*. San Diego: University Associates, n.d.

Each volume in this series of 4 volumes contains 24 hours of result-oriented training designs that can be used in part or in whole. All forms are ready to use, can be duplicated without modification, and can be "mix and matched." Each volume in the series may be purchased individually. The two volumes that are most relevant to this guide are as follows:

Volume 2: Creative Problem Solving. The content includes recognizing a problem when and where it exists, anticipating difficulties during the problem-solving process, determining objectives or goals, establishing results desired when the problem is solved, generating creative and realistic solutions, evaluating alternative solutions against predetermined criteria, implementing the chosen solution in an organized manner, and evaluating the results.

Volume 3: Human Relations Development. Topics covered include options in interpersonal styles; accurate self-perceptions, awareness of others' values, attitudes, and goals; personal assumptions and the work setting; constructive feedback; empathy; dynamic listening; accurate identification of needs; developing trust; constructive confrontation; assertiveness; appropriate self-disclosure; and modeling.

Daggett, W. R., and Marrazo, J. *Solving Problems/Making Decisions*. Cincinnati: South-Western Publishing Co, 1983.

This text-workbook is designed to help students acquire the knowledge and ability to solve problems and make decisions. Students are provided with problem-solving activities and decision-making models to follow as they analyze themselves and compare their attributes for making career and life choices. End-of-chapter activities include short answer questions, a vocabulary list, and a chapter summary.

Eggland, S. A., and Williams, J. W. *Human Relations at Work*. 2d ed. Cincinnati: South-Western Publishing Co., 1981.

This text-workbook offers students the opportunity to participate in a well-organized series of activities dealing with human relations. The workbook develops an understanding of and appreciation for human relations; encourages an understanding of oneself; helps students deal with fellow employees, employers, and customers; and develops links between human relations skills and communication skills. Written in an easy, informal style, the text is useful in any vocational program that prepares students for the world of work. It contains 6 chapters and 40 class activities that require approximately 30 hours to complete.

Fulton, P. J. *Exploring Human Relations*. Boston: Houghton Mifflin Co., 1982.

In this text-workbook, students learn the skills they need for success with people. They gain a clear understanding of the basic concepts of human relations, focusing on developing personal understanding, communicating with others, becoming an effective employee, and setting personal and career goals. Students participate in case studies, readings, group discussions, and role playing, all of which help build problem-solving and decision-making skills.

Herr, E. L., ed. *Career Core Competencies*. New York: Gregg/McGraw-Hill Book Co., 1980.

Focusing on the basic core competencies required for successful employment and career satisfaction, the *Career Core Competencies* program helps students develop career maturity skills—nontechnical skills that relate to the understanding of themselves within educational, occupational, and social contexts. The program includes seven modules that are available separately or in sets; it is also available in one hardcover text entitled *Your Working Life: A Guide to Getting and Holding a Job*, which covers the most important coping skills and competencies presented in the modules. Each of the text-workbook modules, listed next, is divided into sections that combine theory, case studies, practical information, and hands-on exercises and projects. The modules are as follows: "Schools and Careers," "Knowing Yourself," "Making Decisions Work," "Working in Human Relations," "Getting the Job," and "Growing on the Job."

Russon, A. R., and Wallace, H. R. *Personality Development for Work*. 5th ed. Cincinnati: South-Western Publishing Co., 1981.

The title of this text reflects the concern for development of successful work habits and personality traits for all workers. Learning about oneself, dealing with attitudes, coping, communicating, and working are covered. Illustrations, including the use of mimes to pantomime personality characteristics, are included. Follow-up activities and case problems give students an opportunity to develop practical solutions to typical personal and work-related problems.

Coping in the World of Work:
Practice in Problem Solving (Objective #3)

Campbell, R. E.; Wynn, George A.; and Ransom, Robert M. *Coping in the World of Work: Practice in Problem Solving*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1977.

This resource should be useful in preparing your students for the world of work. The valuable packet of materials is designed to assist students in the development of coping strategies that deal with work entry and job adjustment problems. The total packet is available as a classroom set with materials for 30 students or by individual components. The components include the following: an instructor's handbook, a student guide, masters for handouts, and a filmstrip and cassette program with scripts. The goals of this packet are very similar to the goals of this instructional guide, namely, to acquaint students with typical on-the-job adjustment problems such as getting along with supervisors, dealing with tension, and work habits; to teach them a problem-solving approach to handle job adjustment problems, for example, diagnosing problems, developing solutions, and testing the solutions; to help them practice the problem-solving approach with simulated, but real, problems in the classroom; to help them learn and apply problem-solving methods to personalized problems outside the classroom; and to improve their communication skills through involvement in structured group activities and small-group discussions. In order to achieve these general goals, more specific behavioral objectives, called criterion objectives, are used. (Although the materials were developed for younger students, they can give the instructor many good ideas.)

Communication Skills (Objective #6)

Kraska, M. F. *Communication Skills for Trade and Industry*. Cincinnati: South-Western Publishing Co., 1985.

This new book is based on the premise that the ability to communicate effectively is necessary for the success of all those "who wish to become productive and active members of the modern industrial teams" (p. v). The author notes that the need to acquire effective communication skills is becoming increasingly evident for students, not only in their career function but also in preparing for changing job requirements. This text-workbook therefore addresses the needs of students for relevant communication skills in related vocational programs. As an integrated general communications approach to the subject matter, the text includes basic applications materials in written, verbal, and technical skills development.

The introductory chapters focus on basic sentence structure, punctuation, mechanics, and paragraph development. Specific occupational terminology is used in examples and test material in order to maintain student interest through displaying the relevance of communication skills in the workplace. Common terminology from the electrical and electronic, automotive, construction, and machine trades is employed. Examples are also taken from the study of physics, data processing, drafting, and metrics. After establishing the necessary written skills, in succeeding chapters the students are exposed to learning how to locate technical information and how to master verbal skills.

The instructor's manual and key that accompany the text contain a variety of teaching suggestions, lesscn plans, transparency masters, and evaluation procedures. All in all, then, this text-workbook appears to provide the tools for students to accomplish the author's goals, which—in her own words—are as follows: "Today's working environment demands that trade and industrial personnel must not only master specific trade proficiencies, but must also possess a good working knowledge of related communication skills. This basic ability will also enable the trades person to prepare for career enrichment as industrial needs change in a fast moving workplace" (p. vi).

Williams, J. W., and Eggland, S. A. *Communicating at Work*. Cincinnati: South-Western Publishing Co., 1979.

This text-workbook will help students to communicate more effectively at work. It contains illustrations, exercises, and end-of-chapter class activities designed to aid them in practicing effective communication. Approximately 30 hours are required to complete the workbook. The updated version of a companion workbook, entitled *Communication in Action*, is due for release in late 1984.

Speaking, Listening, Writing, and Reading Skills (Objective #6)

Oregon State University and Oregon Department of Education. *Speaking and Listening in Vocational Education*. Salem, OR: Marion Education Service District, 1983.

Oregon State Ur:iversity and Oregon Department of Education. *Writing in Vocational Education*. Salem, OR: Marion Education Service District, 1983.

Oregon State University and Oregon Department of Educaiion. *Reading in Vocational Education*. Salem, OR: Marion Education Service District, 1981.

This series of three handbooks has been developed jointly by the Vocational-Technical Education Department of Oregon State University and the Division of Vocational Education of the Oregon Department of Education—in cooperation with several Oregon school districts—that should be very useful to vocational education teachers.

As the authors of the first handbook state, "Our goal was not to make a speech teacher out of you, but to give you some very practical assistance in working with your students" (p. i). The first sections are devoted to skills and assessments; the last part of each section describes the concepts and provides suggestions for implementing skills into the classroom via an assortment of activities. The writing handbook is divided into seven major sections. The first describes methods of evaluating writing assignments; the next six are organized around the major areas of writing: sentences, paragraphs, composition, correspondence, summary, and note taking. The last section describes rewriting, editing, and proofreading. The reading handbook also is divided into seven sections. The first six are organized around two major headings: the topic and background information (which includes suggested activities and resources). The last section contains ideas to enrich your efforts to improve vocational students' reading skills.

Frye, H. *Teaching Reading in Vocational Education*. Columbus: Vocational Instructional Materials Laboratory, The Ohio State University, 1982.

This manual contains many student activities for providing help to students who lack needed skills for doing required reading in the vocational content areas. The manual allows the instructor to teach reading skills without students' knowing that reading skills are being emphasized. Student reading interest, methods of determining the reading levels of books, context clues, spelling, and comprehension are just a few of the many topics covered in this teaching aid.

Lamb, M., and Perry, D. *Word Studies*. 7th ed. Cincinnati: South-Western Publishing Co., 1981.

This text-workbook contains 85 activities that build students' confidence in their abilities to spell and use words correctly. In addition, students acquire a greater appreciation for, and mastery of, the English language.

Linking Basic Skills to Entry-level Auto Mechanic and Auto Body Worker Tasks. Salt Lake City: Salt Lake Skills Center, Utah Technical College, 1983.

Reading, writing, listening, speaking, and mathematics are an integral part of the duties of many occupations. Administrators, curriculum developers, counselors, and instructors, particularly, require information about what basic skills workers need to perform a job in order to select the most occupationally relevant instructional materials and assessment instruments for use with students. They can then more easily determine entry and exit criteria for their training programs. They can also instruct in the the basic skills more effectively during vocational training. In preparing this work, the authors first identified the duties of the entry-level auto mechanic and autobody worker by using a modified DACUM (**D**eveloping **a** **C**urriculu**m**) occupational analysis process. In this process, a panel of expert workers determined the essential duties of their occupations. The panel then identified specific basic skills necessary to accomplish each task.

Based on the results of this analysis and the application of general criteria for instructional resource and assessment review, lists were formulated of the most relevant basic skills instructional and assessment resources available.

O'Connor, J. R. *Speech: Exploring Communication*. 2d ed. Englewood Cliffs, NJ: Prentice-Hall, 1984.

This textbook gives students a thorough introduction to basic elements of communication, interpersonal communication, public speaking, debate and parliamentary procedure, and performing arts. The text also includes extensive end-of-chapter activities.

Lastly, the following three publications from the Gregg/McGraw-Hill Book Company should be valuable resources for Objective #6.

Spelling Made Easy. New York: Gregg/McGraw-Hill Book Co., 1984.

This text-workbook offers practical instruction for learning to spell the words most commonly used in business correspondence. Each lesson is only four pages long, with two pages of instruction followed by two pages of exercises. Recorded quizzes (on cassettes) for this workbook are available.

Words Made Easy. New York: Gregg/McGraw-Hill Book Co., 1984.

This text-workbook is a flexible program for spelling and vocabulary mastery. It combines the entire *Spelling Made Easy* program with the entire *Vocabulary Made Easy* program.

Vocabulary Made Easy. New York: Gregg/McGraw Hill Book Co., 1984.

This text-workbook emphasizes the vocabulary that students must master to succeed on the job. Each lesson is four pages long, with two pages of text instruction followed by two pages of exercise. The writing style keeps students interested, and the frequent checkup exercises at regular intervals provide immediate reinforcement of the text principles.

Making the Basic and Communication Skills "Real" to Students (Objective #6)

VocEd (Journal of the American Vocational Association) 59, no. 2 (March 1984): entire issue.

Although most of the articles in this entire issue are devoted to making math and science "real" to students, several also go beyond those two basic skills. Communication skills now appear to have come of age and often are discussed in the same breath as math and science. The three articles in the March 1984 issue that may be of most interest are described next.

"Not Just a Skill, But a Solid Education," by C. W. Clawson and H. M. Shealey, describes "how a vo/tech curriculum can be adapted so that it would include all the math and science skills a student would need in order to graduate" (p. 31). The authors also include a very useful full-page chart on "Related Math and Science Course Outline/Vocational-Technical Automotives."

"We Integrated the Academics," by H. L. Carr, describes what the author calls three "duty blocks" in an 11th-grade industrial maintenance program. He writes:

> After 2 years of review, all agreed that the program format should be changed to strengthen the mathematics, science, communications and organizational skills of our program completers. We also agreed that these areas should not be isolated in a theory-based academic program, but integrated with the technical job performance skills, work attitudes and other personal skills we wanted to teach. These skills had to be integrated in a way that would help the individual understand the basic real-life application of the knowledge within the context of the specific occupational field. (pp. 34-35)

"There's a Lot of Math and Science in a High-Tech Car," by B. Hamlin, describes a program "geared not only to train skilled auto mechanics, but to prepare students to run their own small businesses" (p. 37).

Reasoning and Thinking Skills (Objective #7)

Educational Leadership (Association for Supervision and Curriculum Development) 42, no. 1 (September 1984): entire issue.

This entire issue deals with and bears the title "Thinking Skills in the Curriculum." In an overview of the issue, the editor writes that "a fully adequate curriculum . . . should provide for teaching *of* thinking and *about* thinking as well as teaching *for* thinking. Planning such a curriculum is complicated by the diversity of approaches and the kinds of thinking sought in various programs" (p. 3). Here are some of the articles to be found in the magazine: "Critical Thinking Is Not Enough"; "Kinds of Thinking Taught in Current Programs"; "How Can We Teach Intelligence?"; "The Key to Higher Order Thinking Is Precise Processing" ("Teachers can focus on thinking skills by having students describe their mental processes and giving them feedback on erroneous or incomplete reasoning" [p. 67]); and "How to Keep Thinking Skills from Going the Way of All Frills" ("Success in teaching thinking skills results when content objectives are contingent on activities that also promote thinking and when thinking skills permeate the entire curriculum" [p. 75]). For those who wish to infuse problem-solving methods into their teaching, reading this journal from cover to cover is a must.

Organization and Management:
Economics-related Competencies (Objective #8)

Clawson, E. U. *Our Economy: How it Works*. 2d ed. Menlo Park, CA: Addison-Wesley Publishing Co., 1984.

This text introduces important economic principles through studies of the production of familiar goods. It is written in a style that can be easily understood by both junior and senior high students. The text includes student involvement activities in fact finding, analysis, decision making, and role playing. A related text-workbook supplement, entitled *Our Economy: How It Works, Activities and Investigations*, is also available.

Ford, L. G. *Economics: Learning and Instruction*. Cincinnati: South-Western Publishing Co., 1982.

This textbook is a practical how-to manual that divides economic theory into eight simplified, yet comprehensive concept areas: alternative economic systems, supply and demand, income, profits, spending and saving, fiscal policy, the Federal Reserve system, and international economics. Teaching applications follow the presentation of theory, illustrating which theory should be covered and how to present it.

Heilbroner, R., and Thurow, L. *Economics Explained*. Englewood Cliffs, NJ: Prentice-Hall, 1983.

Two of America's most respected economists have written this basic, jargon-free guide to help students better understand how economics directly affects their lives. It covers such issues as inflation, unemployment, interest rates, investing, and saving.

Miller, R. L. *Economics Today and Tomorrow, Enterprise Edition*. New York: Harper and Row Publishers, 1975.

This is a clearly written textbook program that promotes student awareness and understanding of how the U.S. economy works. The book develops economic skills, relates theory to real-world situations, examines current economic issues, and profiles important economists. It is combined with a sequential development of reading, writing, statistical, speaking, and study skills. Case studies and discussion questions are also provided.

Peterson, H. C. *Economics of Work*. Cincinnati: South-Western Publishing Co., 1983.

This text-workbook is designed to help students gain a better understanding of our system of economics. It will help students make the natural linkage between the overall structure of the economy, how it functions, and how workers play a meaningful role in the input side of the economic process. Students will gain an understanding of the role of the individual within a firm, the role of a firm within the economic system, and the interrelationship of government and private enterprise. Students will be exposed to various types of economic problems and will be asked to apply economic concepts to the decision-making process in order to gain an understanding of the economic system.

Quality Circles and Quality of Work Life (Objective #8)

Dewar, D. L. *Leader Manual and Instructional Guide*. Red Bluff, CA: Quality Circle Institute, 1982a.

Dewar, D. L. *Member Manual*. Red Bluff, CA: Quality Circle Institute, 1982b.

Thompson, P. C. *Quality Circles: How to Make Them Work in America*. New York: American Management Associations (AMACOM), 1982.

Harshman, C. L. *Quality Circles: Implications for Training*. Information Series No. 243. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Lloyd, R. F., and Rehg, V. R. *Quality Circles: Applications in Voc Ed*. Information Series No. 249. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Owens, D., and Horvath, Y., eds. *Quality Circles and Quality of Work Life: Directory of Resources*. Milwaukee: American Society for Quality Control, 1981.

These six resources all deal with aspects of the quality of work life concept. According to Dewar, "A quality circle is a group of people who voluntarily meet together on a regular basis to identify, analyze, and solve quality and other problems in their area" (1982b, p. 1). The technique, which originated in Japan, is becoming more widespread in this country as the growing number of books and articles on this topic testify. The six resources noted here, needless to say, represent only a small sample of the available materials for both educators and industrialists. The following paragraphs briefly highlight the nature of these materials:

Dewar's *Leader Manual and Instructional Guide* is precisely what it says it is, namely, a guidebook for establishing and conducting quality circles. The guide includes valuable techniques and suggestions, questions and answers, case studies and ideas for problem prevention, decision analysis methods, cause and effect problem analyses, and the like. The *Member Manual*, the companion document, contains similar information but is, of course, intended for use by the group members.

Thompson's book presents initial background information on the process and then focuses on installing quality circles—strategies and implementation, training, preparing the organizations, and working out the details.

The two publications of the National Center for Research in Vocational Education are also practical guides for understanding the process. Harshman, for example, lists various goals for and steps in implementing quality circles, principles of operation, training concerns, and the like. Lloyd and Rehg look at the concept—at participative decision making, goal setting, and team building—as well as at specific applications of quality circles in vocational education, including suggested quality circles curriculum and a 1-year quality circles course.

The *Directory of Resources*, although several years old, still includes many valuable leads on companies using quality circles and relevant resources and periodicals on that topic. In addition, the directory includes extensive information on the quality of work life concept, which is defined as "a process by which an organization attempts to unlock the creative potential of its people by involving them in decisions affecting their work lives" (p. 37). Lists of resource organizations, technical literature, bibliographies, and audiovisual materials are cited.

Resources on Instructional Approaches

Performance-based Auto Mechanics

Day, G. F., and Herschbach, D. R. *Resource Guide for Performance-based Auto Mechanics Instruction*. College Park, MD: Department of Industrial Education, University of Maryland, 1977.

This resource book looks at ways to develop a performancebased instructional program. It also is intended to assist classroom teachers in keeping abreast of instructional developments in this field. The first section of the guide is particularly relevant to our interests in that it includes a fairly extensive view of the elements of performance-based instructional programs: task analysis (which involves the gathering of information from workers through the use of questionnaires, work observations, or interviews); performance objectives; and criterion-referenced measurement, that is a test or measure constructed to yield measurements that are directly interpretable in terms of specified performance or work standards. Other instructional components presented include employability profiles or training achievement records used to record student progress and learning activity packages (LAPs) that can be designed to cover each terminal performance objective. Detailed examples of an auto mechanics task analysis, a Vocational-Technical Education Consortium of States (V-TECS) performance objective, an employability profile, and training achievement records also are shown. Although the items in this guide date back to the mid-1970s, the lengthy section on curriculum resources (printed and audiovisual) still is very valuable.

The Competency-based (or Performance-based) Approach

Automobile Mechanics: Competency-based Vocational Education. Instructor's Manual. Frankfort, KY: State Department of Education and the Department of Industrial Education and Technology, Western Kentucky University, n.d.

Automobile Mechanics Second Division: Competency-based Vocational Education. Instructor's Manual. Frankfort, KY: State Department of Education and the Department of Industrial Education and Technology, Western Kentucky University, n.d.

These two companion documents are valuable resources for teachers who are considering a competency-based approach to instruction. Both volumes are similar in that they include detailed

program sequence master sheets for both the first year and the "second division" as well as extensive lists of instructional materials required for both time periods. The bulk of the documents, however, is devoted to the instructors' guides and learning activities. The guide sheets include information on such topics as instruction sheets and student self-checks included in the modules; supplemental materials to be used with the modules; required slide-tape presentations and audiovisual materials; required textbooks, references, and manuals; required special tools, equipment, and supplies; attitudes and values to be developed; and notes to the teacher to assist in working with the module. The first year materials include this information for 61 modules; the "second division" includes information on 76 additional modules.

Performance-based Teacher Education

Performance-based teacher education (PBTE) is an approach to teacher preparation in which the instructor is required to demonstrate essential teaching tasks in an actual teaching situation. Actual performance of the tasks ensures that the instructor has not only the knowledge required, but also the ability to perform the competencies that are essential to successful teaching. PBTE, among other tools, uses *modularized materials* that integrate theory with practice.

A number of *modularized materials* have been developed by the National Center for Research in Vocational Education at The Ohio State University and are available through the American Association for Vocational Instructional Materials at The University of Georgia. Each module is an instructional package designed to cover a single teaching skill. The package contains a series of learning experiences that provide information, activities, and feedback devices to help the instructor acquire the skill. Most modules also suggest optional outside references and learning activities.

Two types of materials have been produced: the 100 modules in 10 professional skill categories and a set of printed and audiovisual materials specifically designed for orientation and training of teachers, resource persons, and others using the materials. All printed materials are low cost, paperback, 8 1/2" by 11", and three-hole punched. The modules and student guide are designed to be consumable, and the pages are perforated for easy removal and use.

Category C—Instructional Execution—is particularly relevant to many parts of this instructional guide. The 29 modules in this category focus on the competencies involved in providing classroom and laboratory instruction. The modules are designed to prepare the instructor to use the wide variety of instructional strategies in directing individual and group learning activities.

A quick look at some of the titles will indicate just how relevant the modules are to this guide:

- C-2 *Conduct Group Discussions, Panel Discussions and Symposiums*
- C-4 *Direct Students in Instructing Other Students*
- C-5 *Employ Simulation Techniques*
- C-6 *Guide Student Study*
- C-7 *Direct Study Laboratory Experience*
- C-8 *Direct Students in Applying Problem-Solving Techniques*

- C-9 *Employ the Project Method*
- C-14 *Provide Instruction for Slower More Capable Learners*
- C-15 *Present an Illustrated Talk*
- C-16 *Demonstrate a Manipulative Skill*
- C-17 *Demonstrate a Concept or Principle*
- C-18 *Individualize Instruction*
- C-20 *Use Subject Matter Experts to Present Information*
- C-21 *Prepare Bulletin Boardss and Exhibits*
- C-22 *Present Information with Models, Real Objects and Flannel Boards*
- C-23 *Present Information with Overhead and Opaque Materials*
- C-24 *Present Information with Filmstrips and Slides*
- C-25 *Present Information with Films*
- C-26 *Present Information with Audio Recordings*
- C-27 *Present Information with Televised and Videotaped Materials*

In addition, a number of other modules also are relevant to this guide:

- A-6 *Develop Program Goals and Objectives*
- A-8 *Develop a Course of Study*
- B-2 *Develop Student Performance Objectives*
- B-3 *Develop a Unit of Instruction*
- B-5 *Select Student Instructional Materials*
- B-6 *Prepare Teacher-made Instructional Materials*
- D-1 *Establish Student Performance Criteria*
- D-2 *Assess Student Performance Knowledge*

- D-3 *Assess Student Performance Attitudes*
- D-4 *Assess Student Performance Skills*
- F-5 *Assisting Students in Applying for Employment for Further Education*
- G-8 *Work with Members of the Community*
- J-1 *Establish Guidelines for Your Cooperative Vocational Programs*
- J-3 *Enroll Students in Your Co-op Program*
- J-4 *Secure Training Stations for Your Co-op Program*
- J-5 *Place Co-op Students on the Job*
- J-7 *Coordinate on the Job Instruction*
- J-8 *Evaluate Co-op Students On-the-Job Performance*
- K-3 *Organize Your Class and Lab to Install CBE*
- L-3 *Plan Instruction for Exceptional Students*
- L-8 *Improve Your Communications Skills*
- M-1 *Assist Students in Achieving Basic Reading Skills*
- M-3 *Assist Students in Improving Their Writing Skills*
- M-4 *Assist Students in Improving Their Oral Communication Skills*
- M-5 *Assist Students in Improving Their Math Skills*
- M-6 *Assist Students in Improving Their Survival Skills*

Developing Job Competencies for the Performance-based Approach

Webster, J. *Automotive Tune-Up*. Alsip, IL: American Technical Publishers, 1983.

This textbook is designed to help students train as specialist mechanics in automotive tune-up. The text covers the areas serviced during a tune-up: engine, ignition system, fuel system, and emission control system. Some units explain how these systems work, others explain how to determine what is wrong with them, and still others explain how to repair the systems. The book is divided into six sections: general information, basic engine operation and troubleshooting, starting and charging systems, ignition system, fuel system, and emission control system. Each unit begins

with a list, "Developing Job Competencies," that students should be able to perform and concepts they should understand after studying the unit. In addition, a set of "Self-Check" questions at the end of each unit helps determine if students have met the learning objectives. "Discussion Topics and Activities" are provided for those who want to study the unit's topic in greater depth. "Certification Practice" questions similar to those used on the National Institute for Automotive Service Excellence (NIASE) examinations are provided to help students prepare for a certification test. The answers to these questions are provided immediately following the questions.

Performance Goals and Learning Objectives

Coghlan, D. A. *Automotive Brake Systems*. North Scituate, MA: Breton Publishers/Division of Wadsworth, 1980.

Coghlan, D. A. *Vehicle Chassis System*. North Scituate, MA: Duxbury Press/Division of Wadsworth, 1978.

Ireland, G. E. *Automotive Fuel, Ignition, and Emission Control Systems*. North Scituate, MA: Breton Publishers/Division of Wadsworth, 1981.

Although many textbooks can be found that provide a general overview of the various operational systems of a vehicle, limited text material appears to be available that relates exclusively to the specific content of these three related and somewhat nontraditional texts. What makes them especially unique is that all three utilize a common format, namely, learning objectives stated in the form of performance goals. While proceeding through each chapter of the unit, students become involved by completing both theoretical and practical assignments. At the conclusion of each section, students take a self-test based on the content of that section. This test enables the students to see how well they understood the materials. If there is no need for further review, students proceed to a final test composed of questions based on the section's material as well as items from preceding sections. Although the texts do not attempt to take the place of the manufacturer's shop manuals, they supplement the manuals by providing an expanded view of how the various systems operate.

Simulation

Instructors can create their own exercises to reflect various roles and activities in the automotive shop. However, simulation and role-playing resources are also available from commercial publishers and other educational institutions that have developed their own materials. Several of them relate to the objectives of this guide. Here are a few useful resources.

Koeninger, J. G.; Williams, G.; Shirley, S.; Elias, K.; and Harris, M. *Jasonville USA: The Leadership Simulation*. Oklahoma City, OK: The Leadership Development Institute, 1984.

Jasonville USA, a comprehensive leadership development program, provides a variety of training tools for use in classroom, workshop, or conference settings. The simulation exposes students

to many situations in advance of actual leadership assignments, and graduates of the program should approach leadership assignments with more confidence and with several leadership tools in order to perform more effectively. *Jasonville USA* is a comprehensive program that, when used in its entirety, would take 80-100 hours to present; this time can be easily shortened by selecting modules and situations that target a particular need or fit a required time period. The simulation contains 10 modules, including such areas as listening, group decision making, planning, people and team building, and communications and public relations; it uses filmstrips, role playing, oral and written communication techniques, and structured activities to implement each module. A leader's guide, participant materials, and audiovisual materials are included.

Maier, N. R.; Solem, A. R.; and Maier A. A. *The Role-Play Technique: A Handbook for Management and Leadership Practice*. San Diego: University Associates, 1975.

A revision of the classic *Supervisory and Executive Development*, this handbook gives you Maier's role play in up-to-date settings. The combination of two practical approaches to training—the casebook approach and multiple- or single-group role playing—provides an opportunity for skill practice as well as discussion of ideas and issues. The 20 cases deal with a wide range of management problems, including personnel appraisal interviews, changes in work procedures, enforcement of regulations, employee complaints, fairness of job assignments, employee status and recognition, and discriminatory practices.

Shaw, M. E.; Corsini, R. J.; Blake, R.; and Mouton, J. S. *Role Playing: A Practical Manual for Group Facilitators*. San Diego: University Associates, 1980.

In this book you will discover a resource that is practical and immediately applicable. Written by several highly experienced and widely recognized experts in the field of human resource development, *Role Playing* describes the role-playing method: why and how it is useful, and how you can apply it to resolve a variety of issues, including information dissemination, individual assessment, and training and development.

Teaching Instructional Units/
Instructional Worksheets

Armstrong, I. J. *Auto Mechanics: Volume 1*. Vocational Trade and Industrial Education Series. Stillwater, OK: State Department of Vocational and Technical Education, 1976.

Armstrong, I. J. *Auto Mechanics: Volume 24*. Vocational Trade and Industrial Education Series. Stillwater, OK: State Department of Vocational and Technical Education, 1978.

These two volumes undoubtedly are among the most comprehensive automotive curriculum materials developed in the past 10 years. Volume 1 presents units on orientation and safety, measuring, engines, suspension, and brakes; volume 2 focuses on engine rebuilding, electrical systems, drive train, and accessories. Each unit includes behavioral objectives, suggested teacher activities,

information sheets, assignment sheets, job sheets, visual aids, tests, and answers to the test. A relatively limited number of performance terms are used in the objectives in order to promote clearer communication. Some of the terms are relevant to the objectives of this instructional guide, for example, *describe* (discuss in writing, discuss orally, interpret, explain), *distinguish* (discriminate), and *demonstrate* (show your work, perform an experiment, perform the steps, and so on).

Each unit has a suggested activities sheet outlining steps to follow in accomplishing specific objectives. The author of the curriculum suggests that for best use of the material, instructors should follow these steps: "Provide student with objective sheet, information sheet, assignment sheets, and job sheets; preview filmstrips, make transparencies, and arrange for resource materials and people; discuss the unit's specific objectives and information sheet; and give test. Instructors are encouraged to use any additional instructional activities and teaching methods to aid students in accomplishing the objectives" (Armstrong 1976 and 1978, p. xii).

Since this instructional guide talks about the instructional worksheet method, let us take a brief look at how that approach is described in the two volumes.*

- The **information sheet** provides content essential for meeting the cognitive (knowledge) objectives of the unit. The teacher will find that the information sheet serves as an excellent guide for presenting the background knowledge necessary to develop the skill specified in the unit objective. Students should read the information sheet before the information is discussed in class. Students may take additional notes on the information sheet (1976 and 1978, p. xii).

- **Assignment sheets** give direction to study and furnish practice for paper and pencil activities to develop the knowledges which are necessary prerequisites to skill development. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided which may be used by the student and/or teacher for checking student progress (1976 and 1978, p. xiii).

- **Job sheets** are an important segment of each unit. The instructor should be able to and in most situations should demonstrate the skills outlined in the job sheets. Procedures outlined in the job sheets give direction to the skill being taught and allow both student and teacher to check student progress toward the accomplishment of the skill. Job sheets provide a ready outline for a student to follow if she/he has missed a demonstration. Job sheets also furnish potential employers with a picture of the skills being taught and the performances he/she might reasonably expect from a person who has had this training (1976 and 1978, p. xiii).

Developing Case Studies

Specific resources that contain only case-study problems are not widely available. However, some case-study problems are found in the form of discussion questions at the end of chapters in textbooks or as special activities in workbooks. In addition, here are two general resources on the approach.

Canei, R. A. *Decision Making for Young Executives*. Columbus: Instructional Materials Laboratory, The Ohio State University, 1979.

*These three descriptions are reprinted with the permission of the Curriculum and Instructional Materials Center, Oklahoma Department of Vocational and Technical Education, copyright 1976 and 1978, as indicated

This manual suggests several methods of decision making and provides cases as samples for problem solving. It is based on Ohio's Team Management Decision-making Competitive Activity.

Canei, R. A. *Human Relations Cases*. Columbus: Instructional Materials Laboratory, The Ohio State University, n.d.

Included in this manual are 55 cases for use with the entire class, small groups, or as individual projects. With each case is a competency that might assist in the solution of the case. Also listed with each case are some "Points to Consider" to help the instructor think about all the possibilities involved.

Entrepreneurship Approach

Ashmore, M. Catherine, and Pritz, Sandra, comps. *PACE Revised: Program for Acquiring Competence in Entrepreneurship*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Many good materials exist that can be used to teach about entrepreneurship. One of the most comprehensive is the set of materials developed by the National Center for Research in Vocational Education. The *PACE* materials are modularized, competency based, and are available in three levels of learning:

- **Level 1** is for secondary vocational or prevocational programs. Students gain entry-level knowledge of concept, terms, and planning needed to open a small business, as well as awareness of entrepreneurial career options. (Reading level: 7th grade)

- **Level 2** is for advanced secondary and postsecondary programs. Students become familiar with the principles of entrepreneurship, and develop detailed plans using existing businesses as sources of information. (Reading level: 9th grade)

- **Level 3** is for advanced postsecondary or adult education. Students develop competencies in policy-making, strategies, and management of small business. These units build on previous knowledge and experience. (Reading level: 10th grade)

Eighteen specific *PACE* instructional units are available; the sets at each level contain one module per unit title. Instructor's guides are also available, which include unit objectives, teaching outlines, transparencies, and the like. In addition, a resource guide includes a glossary of business terms, bibliographies, film resources, important addresses, and so on.

Here is the complete list of modules:

- "Unit 1—Understanding the Nature of Small Business"
- "Unit 2—Determining Your Potential as an Entrepreneur"
- "Unit 3—Developing the Business Plan"
- "Unit 4—Obtaining Technical Assistance"
- "Unit 5—Choosing the Type of Ownership"

- "Unit 6—Planning the Marketing Strategy"
- "Unit 7—Locating the Business"
- "Unit 8—Financing the Business"
- "Unit 9—Dealing with Legal Issues"
- "Unit 10—Complying with Government Regulations"
- "Unit 11—Managing the Business"
- "Unit 12—Managing Human Resources"
- "Unit 13—Promoting the Business"
- "Unit 14—Managing Sales Efforts"
- "Unit 15—Keeping the Business Records"
- "Unit 16—Managing the Finances"
- "Unit 17—Managing Customer Credit and Collections"
- "Unit 18—Protecting the Business"

The National Center also has other materials in this area. Here are just two brief examples:

Davis, L., and Zelinko, M. A. *Entrepreneurship in Voc Ed: A Guide for Program Planning*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Assists program planners in selecting entrepreneurship materials. Users will become aware of a variety of curriculum materials, learn to select appropriate ones, learn to identify essential elements of entrepreneurship programs, become aware of alternative approaches, and learn how to develop a program plan. Explores eight curriculum resources in depth, including samples of content.

Hanson, G. A. *Entrepreneurship: A Career Alternative*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

Investigates the literature to provide resources for teaching entrepreneurship skills. Details personal characteristics of entrepreneurs, lists nine factors to consider in selecting a venture, and outlines steps in the start-up process. Describes nine areas in which entrepreneurial skills can be improved.

Lastly, three other resources for those who wish to explore entrepreneurships in more depth are as follows:

American Enterprise Series. Austin: Extension Instruction and Materials Center, The University of Texas at Austin, 1976.

This series, consisting of an instructor's guide and student's manual for each unit, is self-contained and can be used as a third-year high school or community college curriculum. Competency-based units cover the information needed to own, operate, or manage a business enterprise. They can be used as a series or as individual units. The six units in the series are: "Financial Management," "The Management Function," "The Marketing Function," "Merchandising and Buying," "The Promotion Function," and "The Selling Function."

Hutt, R. W. *Creating a New Enterprise*. Cincinnati: South-Western Publishing Co., 1982.

This text-workbook, requiring 15-30 class hours for completion, enables students in a wide variety of classes to study and understand entrepreneurship. It is designed basically to introduce the concept of entrepreneurship, present entrepreneurship as a career path, and provide a realistic framework for starting a business. An instructor's manual is included.

Hutt, R. W. *Discovering Entrepreneurship—Filmstrips and Cassettes*. Cincinnati: South-Western Publishing Co., 1982.

The information presented in this set of four filmstrips and accompanying cassettes can be used to enhance the study of *Creating a New Enterprise* or it can be given as a separate audiovisual presentation. The material explains the world of the entrepreneur, roads to entrepreneurship, legal forms of business enterprise, and procedures for planning a new enterprise. An instructor's manual is included.

Numerous publications on this topic also are available from the Small Business Administration. Here is the address for SBA Publications: P.O. Box 15434, Fort Worth, TX 76119.

Audiovisual Media

The following is a brief selection of some commercial audiovisual (AV) materials that relate to nontechnical skills; the first three resources are available from most of the larger public and university libraries and will help to locate films and video programs.

Educational Film Locator of the Consortium of University Film Centers. 2d ed. New York: R. R. Bowker Co., 1980.

The Educational Film Locator is a listing of titles held by member libraries of the Consortium of University Film Centers, and a compilation and standardization of their 50 separate catalogs, representing about 220,000 film holdings with their geographic locations. *The Locator* is presented as a selective compilation of approximately 40,000 film titles that have been selected by 50 university film library staffs in response to demands from hundreds of thousands of educators from over 75,000 organizational users. This book allows the user three primary approaches to accessing information: by subject, title, and series. In order to facilitate the search process, *The Locator* provides six sections: "Major Subject Grouping"; "Subject Heading and Cross Index to Subjects"; "Subject, Title, and Audience Level Index"; "Alphabetical List of Film Descriptions"; "Series Index"; and "Foreign Title Index." Additionally, a number of special features, such as holdings statements and standard identification numbers for each title, as well as a producer and distributor directory, are included.

"Decision-Making Skills." Mount Kilso, NY: Guidance Associates, n.d.

This program of three filmstrips, three cassettes, a library kit, and teacher's guide helps students understand how values relate to decision making. They learn to find relevant information and to choose the best of the available alternatives. Students first learn the three steps of decision making: determining their personal values, gathering information, and planning a strategy. A dramatized vignette focuses on a young woman as she attempts to decide what she wants. The woman decides which questions to ask and begins to distinguish between decision making and problem solving. The next segment deals with her efforts to gather information about choices, to list alternatives, to do appropriate research, and to seek advice. Students are shown how to weigh risks and probabilities and explore the strengths and weaknesses of four major strategies for making decisions.

The Film File. 3d ed. Minneapolis: Media Referral Service, 1983-84.

This book is the only film and video resource guide that's completely updated annually. Audiovisuals listed in the file are from distributors' catalogs, supplements, new release announcements, and so forth; and it claims to be the most current and comprehensive film and video selection guide available. The third edition lists over 10,000 current film and video titles available from 110 U.S. and Canadian distributors. Titles are indexed by subject area and by title.

"Give & Take" Series. Bloomington, IN: Agency for Instructional Television, 1982. (Twelve 15-minute television and film programs.)

This series is designed to improve personal economics instruction in the schools. The twelve 15-minute programs, used in conjunction with follow-up activities, will help students improve their economic reasoning and decision-making skills. Topics include such areas as public goods and services, supply and demand, and competition. The series enables teachers of many disciplines to incorporate the program within the existing curricula. Each program is designed to stand alone and may be used in any order. Suggested activities and discussion questions can be easily adapted to a variety of learning situations. Although designed for the 8th, 9th, and 10th grades, students at other levels can benefit from the series. The series is also available on loan from the Central Ohio Economic Education Center, College of Education, The Ohio State University, Columbus, Ohio 43210.

Gwyn, B.; Gwyn, J. K.; Sander, B. R. *The Business of Oral Communication—20 Audio Cassettes*. Cincinnati: South-Western Publishing Co., 1980.

This instructional material is designed to equip students with the basic oral communication competencies necessary for success in their business and personal lives. The package consists of a series of audiocassettes in three modules. A study guide or workbook is available for each module. Each module is self-contained and can stand alone as a unit of study.

- *Module 1: Fundamentals*—Module 1 places emphasis on the important basics of oral communication—proper use of voice, mastery of conversational skills, and listening.

- *Module 2: Person to Person*—In this module, purposeful oral communication between two people in a variety of work situations is emphasized. Instruction focuses on communication by telephone and person-to-person communication in interview situations.

- *Module 3: Selling, Speaking, Meeting*—This module develops the art of oral communication in three specific areas: selling; making formal presentations; and participating in and leading the small-group business meeting.

Hannaford, Alonzo. *Job Responsibilities*. Developed by Interpretive Education. Mount Kilso, NY: Guidance Associates, n.d.

This program of two filmstrips, one cassette, a library kit, and teacher's guide shows students what it means to be a good employee. The program emphasis is on key skills: the importance of following instructions, cooperating with other workers, and developing good work habits. The employer's responsibilities also are covered: providing clear job description, explaining how the job has to be done, and defining the expected level of performance.

Watts, Michael, ed. "The People on Market Street." Developed by the Indiana Council for Economic Education. West Lafayette, IN: Purdue Research Foundation, 1983.

"The People on Market Street" film series and accompanying student activities workbook are designed for instructors who do not have extensive training in economics. The films can be used in any order, and many of the activities from the workbook can also be used with other films and audiovisual packages, or even independently. This series is available on loan from the Central Ohio Economic Education Center, The Ohio State University, Columbus, Ohio 43210. Titles of the films follow:

- #1 - "Scarcity and Planning"
- #2 - "Cost"
- #3 - "Demand"
- #4 - "Supply"
- #5 - "Market Clearing Price"
- #6 - "Wages and Production"
- #7 - "Property Rights and Pollution"

Principles of Management. Austin: Extension Instruction and Materials Center, The University of Texas at Austin, 1983.

Principles of Management is a set of 15 color videotapes covering core competencies in the management domain. Each tape is available in any format (3/4", VHS, or Beta) and includes self-study packets for individual and group instruction. Designed for postsecondary, some of the 20- to 30-minute tapes could also be used at the secondary school level.

Tape 1: "The Job of Management"
Tape 2: "Approaches to Management Thought"
Tape 3: "The Manager's Environment"

Tape 4: "Managerial Decision Making"
Tape 5: "Planning: The Primary Function"
Tape 6: "Planning: The Process"
Tape 7: "Organizing: The Structuring Function"
Tape 8: "The Informal Organization"
Tape 9: "Staffing: Matching People to Jobs"
Tape 10: "Staffing: Developing the Employee"
Tape 11: "Leadership: Working with People"
Tape 12: "Motivation: Why Employees Work"
Tape 13: "Communication: The Thread of Unity"
Tape 14: "Change and Conflict"
Tape 15: "Controlling: The Thermostat"

The Video Source Book. 5th ed. Syosett, NY: The National Video Clearinghouse, n.d.

The Video Source Book features more than 35,000 programs currently available on video from more than 700 sources. The book is divided into five major sections: (1) videodisc index, (2) program listings, (3) main category index, (4) subject category index, and (5) video program sources index. Acquisition availability for each program is explained; options range from rental to purchase to loan or even duplication of the program.

Cooperative Education

Humbert, J. T., and Woloszyk, C. A. *Cooperative Education*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1983.

This resource examines the pivotal roles, activities, and legislation involved in co-op education, with special attention given to the role of the program coordinator. It presents a framework for step-by-step planning and implementation. Also discussed are the benefits in co-op programs for students and employers and recommendations to improve co-op education in the future.

Mason, R. E.; Haines, P. G.; and Furtado, L. T. *Cooperative Occupational Education—and Work Experience in the Curriculum*. 3d ed. Danville, IL: Interstate Printers and Publishers, 1981.

The major objective of this text is to help orient guidance personnel, directors of vocational education, supervisory personnel, and school administrators to the methods of organizing and operating high-school-level co-op education programs. The topics are presented in a logical sequence, starting with an overview of the emerging needs in the world of work. This is followed by a presentation of curriculum patterns involving the work environment and a section on the planning, organizing, and operating of co-op occupational education programs.

Stull, W. A., and Zedlitz, R. H. *Cooperative Work Experience Manual*. Cincinnati: South-Western Publishing Co., 1984.

This text-workbook takes students from the first day on their co-op job through a series of 34 work-related activities designed to help them become more employable. The activities focus on tasks such as evaluating progress, communicating at work, and management of time and money. The students become active participants in the learning process by helping to structure the learning experiences on the job. This text-workbook can be used as the primary focus of a co-op work experience class or on an individualized basis outside the structured classroom.

Industrial Cooperative Training

Notgrass, T. *Automobile Mechanic Second Year: Service and Repair—Student's Guide*. Austin: Center for Occupational Curriculum Development, University of Texas, 1981.

This manual is intended for second-year students in industrial cooperative training who have studied *Automobile Mechanic Fundamentals* during the first year. Based on *Auto Service and Repair* by Stockel, this manual is designed for individualized instruction under supervision of a coordinator or instructor. It contains 16 sections that may be studied in any sequence to coordinate the technical information with the training being received on the job. The first assignment, how to use the guide, should be completed first. Each section is composed of from 1 to 12 assignments that follow this format: objectives that tell what the student is to learn for that assignment, identification and location of the assignment in the reference, and exercises to help the student master the objectives.

Establishing Standards for a Cooperative Vocational Education Program

Standards for Vocational Automotive Service Instruction. Detroit: Motor Vehicle Manufacturers Association of the United States, 1979.

Every secondary school that has an automotive program should have a copy of these standards at its fingertips. Prepared for educators and the industry as a special project of the Motor Vehicle Manufacturers Association/American Vocational Association (AVA) Industry Planning Council, the document contains 11 sections of standards and guidelines dealing with the following topics: curriculum; the instructor; facilities; tools, supplies, and equipment; students; services performed; cooperative vocational education; program evaluation; and the ongoing program (i.e., technological change, changing teaching methods, the changing student, and so on). The appendices are equally valuable. They include the names, addresses, and descriptions of all of the major motor vehicle associations; page after page of sources for automotive instructional materials (including automotive texts); and related job descriptions taken from the *Dictionary of Occupational Titles*.

Reprinted here are the standards for a cooperative vocational education program and the guidelines for establishing a cooperative automotive service program.* Three other items are especially relevant to the purposes of this instructional guide. First, consider these two curriculum goals when you consider your own:

1. To instill desirable attitudes toward work and the quality of performance

2. To develop respect for the rights and property of fellow workers, managers, and customers (p. 12)

The second item suggests automotive service curriculum levels for 10 subject-matter areas including several areas that have special relevance to this instructional guide (e.g., merchandising and business practices). The third item lists the goals of and provides course outlines for an automotive service management curriculum, including suggested courses that deal, in part, with written and oral communication skills and problem solving.

Standards for a cooperative vocational education program. The following special conditions should be considered when establishing a cooperative vocational education program:

- Students must be of legal age to meet Federal and State employment requirements and established standards of basic automotive training.

- Students should be legally employed in occupations related to their in-school vocational instruction.

- Students should average as many hours per week on the job as they attend classes in school, or as regulated by State law.

- Students should be placed in jobs on the basis of a training plan agreed to by the school, the employer, and the parents (if a minor); a form suitable for a training plan is included in this section.

- Training plans should be individualized for all students, depending upon their individual needs and the requirements of the job for which they are being trained.

- The training plan should provide for employer and teacher-coordinator evaluation of student progress concerning activities specified in the plan.

- Students should be paid commensurate with their abilities, with periodic increases as they progress.

- Students should be enrolled in this program as a result of guidance, counseling, and testing, and only with the approval of the cooperative vocational education teacher.

- Student work schedules should follow an organized pattern designed to provide each student with a variety of on-the-job experiences.

- Educational credit toward graduation should be granted to students for their cooperative work experience.

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*Reprinted with the permission of the Motor Vehicle Manufacturers Association of the United States, Inc., 300 New Center Building, Detroit, Michigan 48202.

- The program should be under the supervision of a teacher-coordinator qualified in the automotive service field.
- The teacher-coordinator should be given ample time to visit the students at work and to confer with employers regarding their progress.
- Another form suitable for recording the overall progress of a cooperative student is included in this section, and student progress is also recorded on the training plan.

The following are guidelines for establishing a cooperative automotive service program as a long-range operation.

- Obtain approval of the program from the proper school authorities.
- Approach the Advisory Committee of the local automotive service industry and submit the proposed program in detail, stressing all benefits in order to enlist the committee's cooperation; if such a committee does not exist, approach the local dealer organization or the individual dealers regarding the program.
- Make sure the program is planned so that it is in line with all standards contained in this book.

Resources on Labor, Business, and Industry Contacts

Quality of work life education has been going on in labor, business, and industry for several years. Many companies are making an effort to facilitate the development of nontechnical skills in all levels of their hierarchy. Some of the larger companies have developed their own resources to teach these skills and to aid their employees in group problem solving. Resources developed and used by these groups could prove useful to vocational and technical educators. Therefore, you should consider labor unions and businesses in your area in order to obtain materials and guidance that could prove useful. A brief sampling of some of the unions and companies that are currently involved in the QWL process is as follows:

COMPANIES

- American Telephone and Telegraph (ATT)
- Bendix
- General Motors
- Chrysler
- Dana
- Rockwell International
- Ohio Bell

UNIONS

- Communications Workers of America
- International Associatons of Machinists and Aerospace Workers
- United Auto Workers
- United Steelworkers of America
- International Brotherhood of Teamsters, Chauffeurs, Warehousemen, and Helpers of America
- United Food and Commercial Workers International Union

University Associates also publishes reference materials in this area. Suggested titles from this source are *Process Politics: A Guide for Group Leaders*, *A Trainer's Manual for Process Politics*, *Quality Circles: A Strategic Approach*, and *Making Meetings Work: A Guide for Leaders and Group Members*.

Several large organizations, supported by business and industry, also have done work in the area of economic education. Several of these more important organizations are described next.

The Joint Council on Economic Education, 1212 Avenue of the Americas, New York, NY 10036

This organization aims to improve and expand the teaching of economics in the schools and to improve the quality of economic teaching. Part of the structure of the Joint Council is the affiliate State Joint Councils; within each State Joint Council are one or more Centers for Economic Education. Various instructional materials are available.

The Advertising Council, 825 Third Avenue, New York, NY 10022

The Advertising Council has developed a free booklet entitled "The American Economic System . . . and Your Part in It." It has now established a new campaign based on the question: "How High is Your E.Q.?"

Chamber of Commerce of the United States, 1615 H Street, N.W., Washington, DC 20062

The national chamber provides tools and techniques for use in programs sponsored largely by local and State chambers. These materials generally are available for a fee to members and students, business and civic groups.

National Association of Manufacturers, 1776 F Street, N.W., Washington, DC 20062

The National Association of Manufacturers is currently involved in economic education programs through a tax-exempt organization called the Foundation for Economic Freedom.

American Management Associations, 135 West 50th Street, New York, NY 10020

The AMA offers a number of relevant materials in the area of interpersonal skill development.

In addition, many industries have their own specific organization, which can be identified by using the following resource: *National Trade and Professional Associations of the United States*, Columbia Books, Inc., 777 14th Street, N.W., Washington, DC 20005.

Additional information may also be obtained from the American Society of Association Executives, 1517 I Street, N.W., Washington, DC 20005 or the Trade Association Division, Chamber of Commerce of the United States, 1615 H Street, N.W., Washington, DC 20062.

Important Addresses

This list includes the addresses of the publishers and other agencies cited in the resource sections.

Addison-Wesley Publishing Company
One Jacob Way
Redding, Massachusetts 01867

Agency for Instructional Television
P.O. Box A
Bloomington, Indiana 47402

American Association for Vocational
Instructional Materials
University of Georgia
120 Driftmier Engineering Center
Athens, Georgia 30302

American Society for Quality Control
230 West Wells Street
Milwaukee, Wisconsin 53203

American Society for Quality Control
230 West Wells Street
Milwaukee, Wisconsin 53203

American Technical Publishers, Inc.
12235 South Laramie Avenue
Alsip, Illinois 60658

American Vocational Association
2020 North 14th Street
Arlington, Virginia 22201

Association for Supervision and
Curriculum Development
5999 Stevenson Avenue
Alexandria, Virginia 22304

Breton Publishers
A Division of Wadsworth, Inc.
P.O. Box 446
North Scituate, Massachusetts 02060

Duxbury Press
A Division of Wadsworth, Inc.
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